The RUBBER AGE

July, 1947

PUBLIC LIBRARY
JUL 0 1947
DETROIT

R·T·VANDERBILT·CO·N·Y·S·A·
AMERICAN PRODUCTS

THE *ULTRA* ACCELERATORS

We have the goods—ready to ship to you. Our warehouse stocks are plentiful.

A continuation of your business will be appreciated. We continue twenty-five years work to further improve these materials.

R. T. VANDERBILT CO., INC.

230 PARK AVENUE, NEW YORK 17, N. Y.

R·T·VANDERBILT·CO·N·Y·S·A·
AMERICAN PRODUCTS

For better resistance to heat and aging

Use Du Pont ACCELERATOR 2MT

ACCELERATED AGING TESTS show that the use of 2 MT in rubber stocks results in superior resistance to heat and oxidation. A comparison of the effect of 2 MT and MBT is shown in the data below. The heat resistance of the compositions was obtained by aging test specimens in an air oven at 212° F. Resistance to oxidation was determined by aging the stocks in an oxygen bomb, operated at 158° at 300 psi oxygen pressure.

TEST RECIPES

Compound	A	B
Smoked Sheets	100	100
Zinc Oxide	10	10
Stearic Acid	2	2
Neozone D	1	1
Sulfur	2.75	2.75
2MT	0.75	—
MBT	—	0.85
Cure: 60 min. at 267° F.		

The tensile strengths and elongations at break before and after aging are shown in Table I.

TABLE I

Compound Accelerator	Tensile Strength (psi) A 2MT	Tensile Strength (psi) B MBT	% Elongation at Break A 2MT	% Elongation at Break B MBT
Original	4300	4300	790	740
After aging 2 days at 100° C oven	2800	225	580	200
After aging 16 days in oxygen bomb	3100	1625	680	560

WHILE BOTH STOCKS exhibit practically identical original properties, the superior aging characteristics of the 2 MT accelerated stock are clearly shown by the fact that it retained a much higher proportion of the original strength and elongation than the MBT accelerated compound.

The advantage of accelerating with 2 MT is confirmed by the superior service of tires built from stocks containing it.

Other important advantages for Accelerator 2MT in rubber stocks are:

Exceptionally low heat build-up.
Outstanding resistance to flex-cracking.
Little tendency to revert during long curing.
Excellent resistance to tear at elevated temperatures.

These characteristics suggest the use of Accelerator 2 MT in all compounds for dynamic service where the vulcanizate is exposed to severe mechanical working such as in tires, belts and vibration dampeners.

Write us for specific recommendations on use of Accelerator 2 MT.

DU PONT REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

RUBBER CHEMICALS DIVISION

New Technical Bulletin on Adhesives

The Adhesion of Fibers to Elastomers is the title of a 24-page technical bulletin recently published by the Rubber Chemicals Division. This bulletin deals with the compounding and processing of adhesives for adhering various fibers to elastomers. Data on solvent adhesives utilizing a new bonding agent and on latex with an outstanding latex carrier for phenol formaldehyde bonding agents are presented.

These products are briefly described below:

MDI-50—a chemical bonding agent

MDI-50 is a 50% solution in orthodichloro-benzene of the reactive chemical methylene bis (4 phenyl isocyanate). Its utility as a bonding agent is associated with the fact that it has two reactive groups in a single molecule. It will react with any compound possessing an active hydrogen atom; i.e., water, cellulose-wood, paper, cotton; amines, alcohols, esters and ketones.

MDI-50 is used primarily for bonding textile fibers to elastomers. Other uses are being investigated, and it appears promising for bonding elastomers to metals and to wood. The reactivity of MDI-50 also suggests the possibility of its use as a vulcanizing agent for various types of elastomers.

MDI-50 is best used by adding it to an elastomeric cement which is then used as a primer applied directly to fabric such as cotton, nylon or rayon. Such cements may be made from natural rubber, most neoprenes, GR-S, or the butadiene-acrylonitrile interpolymers.

BAC LATEX— New interpolymer latex

BAC Latex is an interpolymer latex having a 40% dry solids content. BAC Latex was developed specifically to act as a carrier for the resorcinol-formaldehyde type of bonding agent. It is especially useful for bonding nylon fibers to neoprene, GR-S or natural rubber compounds.

Extra copies of this informative bulletin on adhesives are available. Write to:

RUBBER CHEMICALS DIVISION
E. I. du Pont de Nemours & Co. (Inc.)
Wilmington 98, Delaware

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. July, 1947. Vol. 61, No. 4.

SUPERIOR ABRASION RESISTANCE

Parts made from HYCAR synthetic rubber have 50% greater abrasion resistance than parts made from natural rubber. That means they'll last longer, give more dependable performance in the most severe service, and save maintenance and replacement time.

But that's only one of HYCAR's unusual and valuable properties. Examine the list in the box at the right. Think of these properties in terms of your requirements of rubber parts. Realize that these properties may be had in an almost limitless number of combinations, each designed to meet the specific service conditions of the finished part.

We have developed more than 5000 recipes for HYCAR compounds — each compound engineered to do a certain job. If you're looking for rubber parts that will give long life, dependability, and economical operation, *specify HYCAR.*

Ask your supplier for parts made from HYCAR. Test them in your own applications, difficult or routine. You'll learn for yourself that it's wise to use HYCAR for long-time, dependable performance. For more information, please write Department HB-7, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

CHECK THESE SUPERIOR FEATURES OF HYCAR

1. **EXTREME OIL RESISTANCE** — *insuring dimensional stability of parts.*
2. **HIGH TEMPERATURE RESISTANCE**—*up to 250° F. dry heat; up to 300° F. hot oil.*
3. **ABRASION RESISTANCE**—*50% greater than natural rubber.*
4. **MINIMUM COLD FLOW**—*even at elevated temperatures.*
5. **LOW TEMPERATURE FLEXIBILITY**—*down to —65° F.*
6. **LIGHT WEIGHT**—*15% to 25% lighter than many other synthetic rubbers.*
7. **AGE RESISTANCE**—*exceptionally resistant to checking or cracking from oxidation.*
8. **HARDNESS RANGE**—*compounds can be varied from extremely soft to bone hard.*
9. **NON-ADHERENT TO METAL**—*compounds will not adhere to metals even after prolonged contact under pressure. (Metal adhesions can be readily obtained when desired.)*

Hycar

Reg. U.S. Pat. Off.

American Rubber

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

This advertisement appeared in a long list of carefully selected business papers TO HELP YOU SELL parts made from HYCAR.

RECIPE FOR KEEPING COOL!

(use Philblack-A)

Hot weather is hard on tires! . . . Long grueling miles on sizzling highways often cause failures. But tires made with Philblack-A give you a number of important advantages. *Their heat build-up is low*. In addition, they tend to maintain tensile and modulus at these high operating temperatures. Those are two of the reasons why so many tire and tube manufacturers . . . after testing Philblack-A under all conditions . . . are using this black in their products.

Philblack-A also helps you in your plant operations with smooth, easy extrusion, excellent mold flow, and shorter mixing cycles.

Try Philblack-A in the manufacture of your rubber products; place an order now. See for yourself how this remarkable black can be of help in your plant and products.

PHILLIPS PETROLEUM COMPANY

Philblack Division

EVANS SAVINGS AND LOAN BUILDING · AKRON 8, OHIO

Now . . . a new polyvinyl material

GEON Paste Resin

NO HOT MILL MIXING NECESSARY; NO VOLATILES REQUIRED FOR MOST APPLICATIONS; NO PRESSURE NEEDED FOR MOLDING; CAN BE CAST OR DIPPED; NO SHRINKAGE OR INTERNAL STRAINS IN FINISHED PRODUCTS

GEON paste resin is a new raw material that closely approaches the ultimate in simplicity of compounding and fabrication.

Easy to Compound

Simply stir the resin, plasticizer, and pigments. After eliminating any trapped air the mixture is ready for fabrication into finished products. No solvents or other volatiles—no hot mill mixing (when used in making thin films or coatings it may be desirable to pulverize the resin).

Easy to Apply

Compounded GEON paste polymer is especially suitable for low pressure molding. Or it may be cast as sheet or film, or as coatings for fabrics, fibres, and papers. In other applications, a simple dipping process may be used. In all cases, the application of heat fuses the paste into a homogeneous vinyl plastic.

Many Outstanding Properties

Products made from or with GEON paste resin may have all the desirable properties of products made from GEON by other methods; resistance to oils, chemicals, abrasion, heat, cold, flexing, sunlight, aging, water, flame, and most other normally destructive factors. Products made from GEON paste resin may be brilliantly or delicately colored.

Write for Information

We will be glad to work with you on special problems or applications. Limited quantities of GEON paste resin are available for experimental purposes. For more information please write Department R-7, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

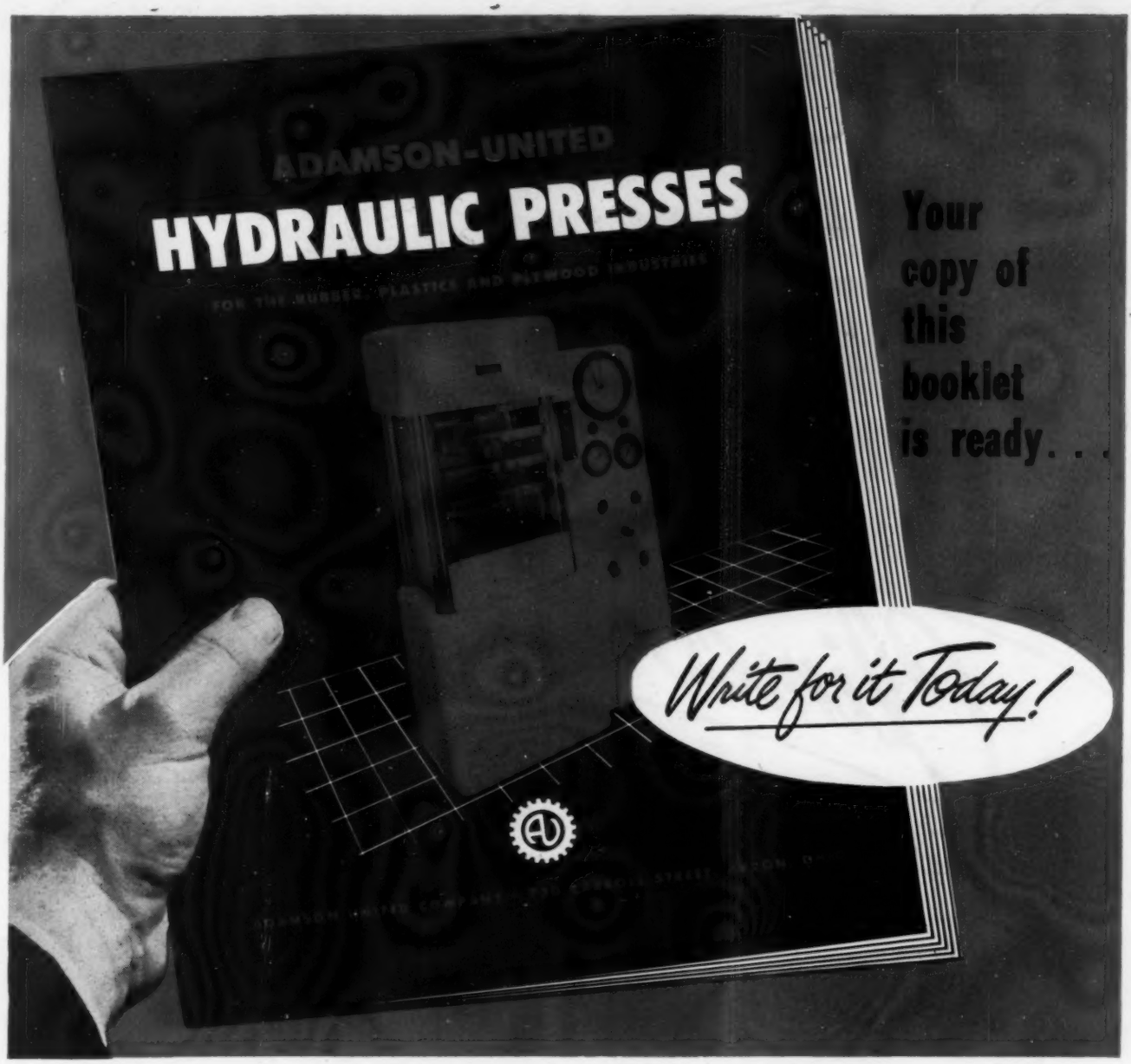
Good-rite
VULTROL
for use in American rubber compounding
to prevent scorching, and for recovering
scorched stocks
GOOD-RITE AND VULTROL REG T M U S PAT OFF

For technical data please write Dept. CB-7

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

ROSE BUILDING, CLEVELAND 15, OHIO



It illustrates and describes the various types of presses successfully used by the country's largest manufacturers of rubber and plastics products.

Designs of the various units illustrated are available for reproduction or they may be revised to meet specific operational or product requirements. A letter requesting a copy places you under no obligation.

We also invite your inquiry concerning presses for new or unusual applications. Our engineers will gladly cooperate with your own technical staff in the development and design of all types of equipment and processes for rubber and plastics manufacture.

ADAMSON UNITED PRODUCTS

- Mills
- Refiners
- Crackers
- Washers
- Rubber Sheeting and Coating Calenders
- Plastic Film Calenders
- Calender Wind-ups
- Calender Cooling Rolls
- Complete Calender Accessory Equipment
- Large Molds
- Pot Heaters
- Vulcanizers
- Autoclaves
- Hydraulic Presses
- Multi-Platen Presses
- Automatic Curing Presses
- Belt Curing Presses
- Compression Molding Presses
- Plywood Presses
- Auxiliary Equipment

ADAMSON UNITED COMPANY

Largest Supplier of Hydraulic Presses For The Rubber and Plywood Industries

AKRON, OHIO

In the New York Area address Inquiries to
441 Lexington Ave., New York City

In the Chicago Area address Inquiries to
140 S. Clark St., Chicago, Illinois

Subsidiary of United Engineering and Foundry Company

Serving the Rubber Industry for 25 Years

During this time, Climco Processed Liners have been used by hundreds of rubber processors all over the world to achieve better production at lower cost. Their satisfaction and repeat orders account for Cleveland Liner's recognized leadership in the field of liner processing.

We appreciate the patronage received over the years, and pledge continuance of the quality standards that have distinguished our products for a quarter century.

Manufacturers of

CLIMCO PROCESSED LINERS • LINERETTE INTERLEAVING PAPER

THE CLEVELAND LINER & MFG. CO.

5508 Maurice Avenue • Cleveland 4, Ohio, U. S. A.

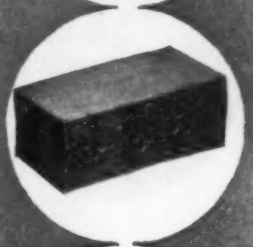
Cable Address: "BLUELINER"

Count on

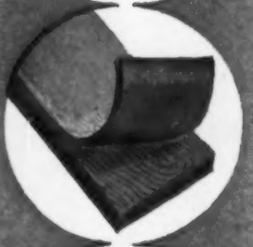
CHEMIGUM 101

the High-Solids Latex
that's 5 ways better
for

DIPPED GOODS



FOAMED RUBBER



ADHESIVES

WIRE
INSULATION

WATER-BASED
PAINTS

IN any of the applications shown here, you can rely on **CHEMIGUM 101,** the all-purpose latex, to do a standout job. Recently developed by Goodyear Research, **CHEMIGUM 101** is a butadiene-styrene (45-55) ratio copolymer latex containing approximately 55% solids.

It gives you these 5 worth-while advantages:

1. It is quick-drying

2. Possesses excellent physical properties —high tensile and elongation with good tear strength

3. Has remarkable stability, both mechanical and thermal

4. Has extremely low water-absorption

5. It is non-staining

Combined with GRS latices, **CHEMIGUM 101** will improve both physical properties and processing characteristics. It is available only as an uncompounded latex. For complete information, write: Goodyear, Chemical Products Division, Plastics and Coatings Dept., Akron 16, Ohio.

Chemigum (pronounced Kem-e-gum)—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

In this new 3A Banbury Mixer, chamber sides that swing open horizontally give convenient access to the interior to make thorough cleaning easier. This is a decided advantage in preventing contamination of a batch from a preceding one when color or type of stock is changed. Designed especially for processing plastics, this new 3A is ruggedly built for heavy duty service and will also handle rubber and synthetics.

Another important feature of this new 3A is the "Uni-Drive," which provides smooth, efficient power transmission under the heaviest torque loads, increases service life and reduces maintenance of the gearing and other elements. All gears are removed from the Banbury and enclosed in a separate housing, where, with the bearings, they are automatically lubricated. Smooth-operating universals connect the gears with the rotors.

Other features include: (1) Step-up type closures of the bottom discharge door to prevent leakage of powders; (2) Shields to prevent oil or tailings from dust stops dropping on discharge door and being carried into the chamber; (3) extended neck to accommodate greater volume of bulky material; (4) circulation of temperature-controlling fluid in throat as well as in chamber sides and rotors; (5) optional chrome-plating of interior surfaces.

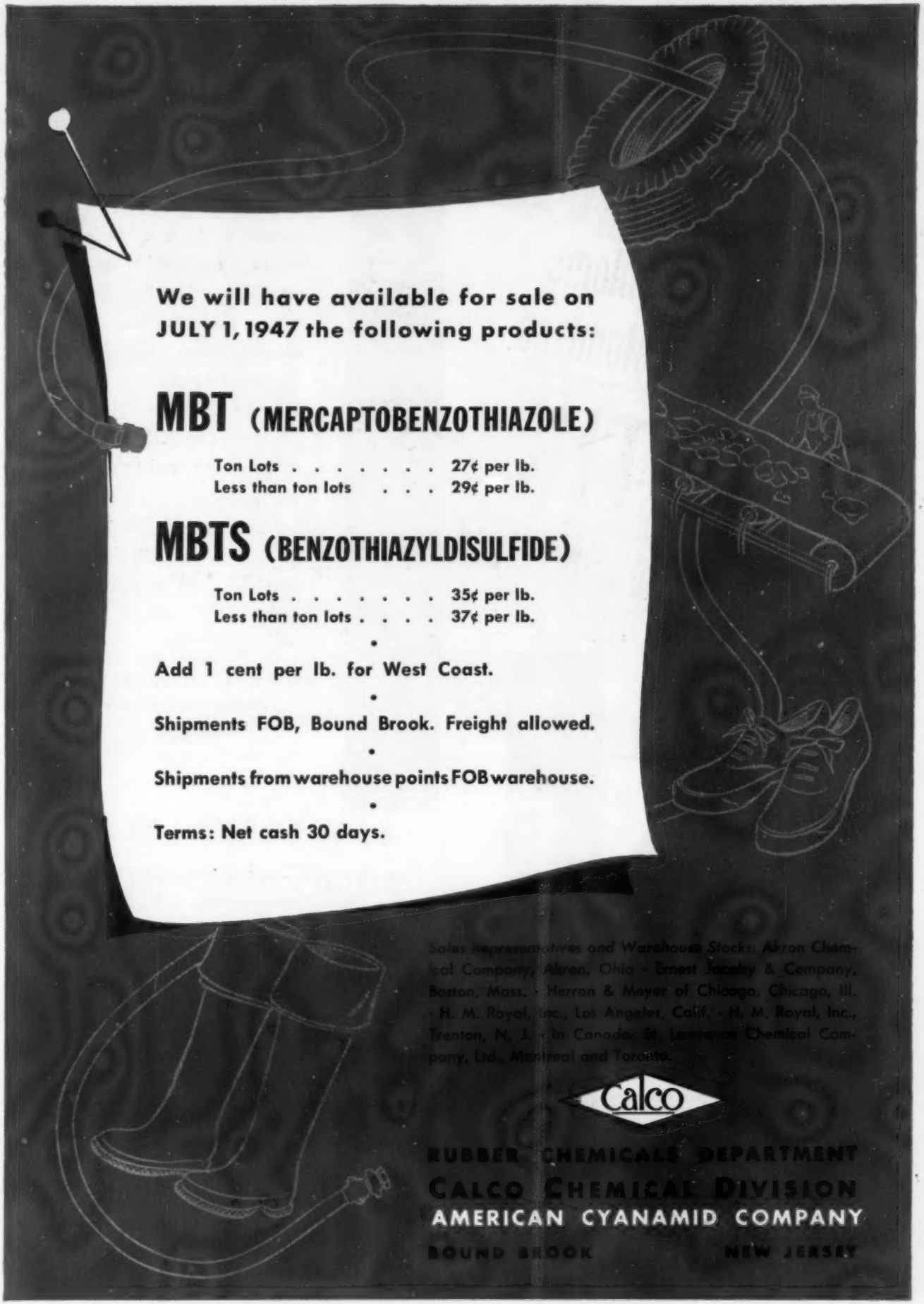
We shall be glad to send you full details of this new Banbury on request. No obligation, of course.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Plants: Ansonia, and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Chicago, Akron, Boston, Los Angeles, Tulsa, Houston.

Farrel-Birmingham

FB-406


We will have available for sale on
JULY 1, 1947 the following products:
MBT (MERCAPTOBENZOTHIAZOLE)
Ton Lots . . . . . 27¢ per lb.
Less than ton lots . . . 29¢ per lb.
MBTS (BENZOTHIAZYLDISULFIDE)
Ton Lots . . . . . 35¢ per lb.
Less than ton lots . . . . 37¢ per lb.
•
Add 1 cent per lb. for West Coast.
•
Shipments FOB, Bound Brook. Freight allowed.
•
Shipments from warehouse points FOB warehouse.
•
Terms: Net cash 30 days.
Sales representatives and Warehouse Stocks: Akron Chemical Company, Akron, Ohio • Ernest Jacoby & Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto.
Calco
RUBBER CHEMICALS DEPARTMENT
CALCO CHEMICAL DIVISION
AMERICAN CYANAMID COMPANY
BOUND BROOK NEW JERSEY

Avoid Getting "Stuck" on Adhesive Problems ...there's a Customized BOSTIK For every Bonding Need

Our business is to answer your adhesive problems. Whatever material, or combination of materials, are presenting bonding difficulties to your operation, there is good reason to believe we can solve the problem quickly and to your complete satisfaction.

In fact, there are over 1000 good reasons. That's how many BOSTIK *Customized* Adhesives we have developed and proved in actual use . . . there's a BOSTIK adhesive to stick any material to any material.

The more unusual your problem, the better we'll like it. So get in touch with us, with the assurance that we deal in complete confidence.

Made by the Manufacturer of RUBBERGRIP CEMENT for home and office use

THE B. B. CHEMICAL COMPANY
Cambridge, Massachusetts

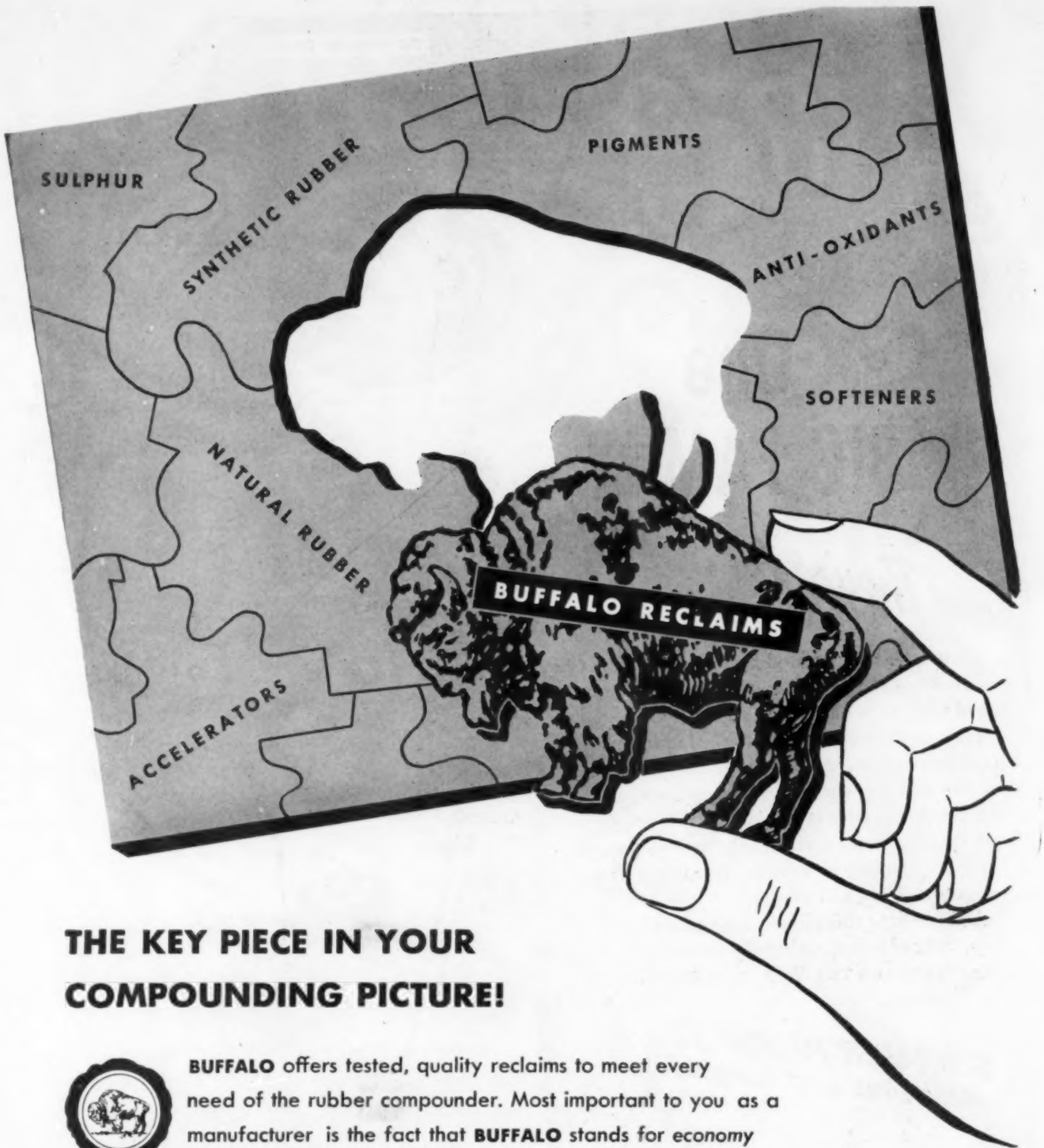
Pump housing. Hard rubber on machined casting iron.

Turbine blower — handles acid fumes and moist air. Soft rubber on light-gauge C-R steel.

Floor machine switch box electrical insulation. Neoprene cover on cast iron.

The Glover Coating Company in Malden, Mass., uses a variety of BOSTIK *Customized* Adhesives to bond natural rubber, neoprene, vinyl plastics and metal in almost every possible combination. See Illustrations.

Says Mr. Manson Glover, "Nobody could do a better service job than B. B. has done for us over the 14 years that we have been using BOSTIK *Customized* Adhesives."



THE KEY PIECE IN YOUR COMPOUNDING PICTURE!

BUFFALO offers tested, quality reclaims to meet every need of the rubber compounder. Most important to you as a manufacturer is the fact that **BUFFALO** stands for *economy* as well as for quality.

Whether your business is building tires and tubes, making children's toys or fabricating any of the newer finished rubber products, it will pay you to find out how **BUFFALO** can help you in your processing.

U. S. RUBBER RECLAIMING CO., INC.

500 Fifth Ave., New York 18, N.Y. (Plant at Buffalo, N.Y.)

TRENTON . . . H. M. Royal, Inc., 689 Pennington Ave.
TORONTO . . . H. van der Linde, Ltd., 156 Yonge St.

65 Years Serving the Industry Solely as Reclaimers

One BIG FAMILY— and They're All Schrader

Schrader has devoted more than a century exclusively to the scientific study and manufacturing of a line of products to control compressed air.

How well Schrader has succeeded in reaching its objective is evidenced in the completeness of its line and its world-wide acceptance.

Schrader products are adaptable to various types of tubes, rims, wheels—on every type of pneumatic vehicle, from half ton jeeps to twenty ton giants.

As a result of this pioneering and leadership, Schrader has rightfully earned the title, STANDARD THE WORLD OVER.

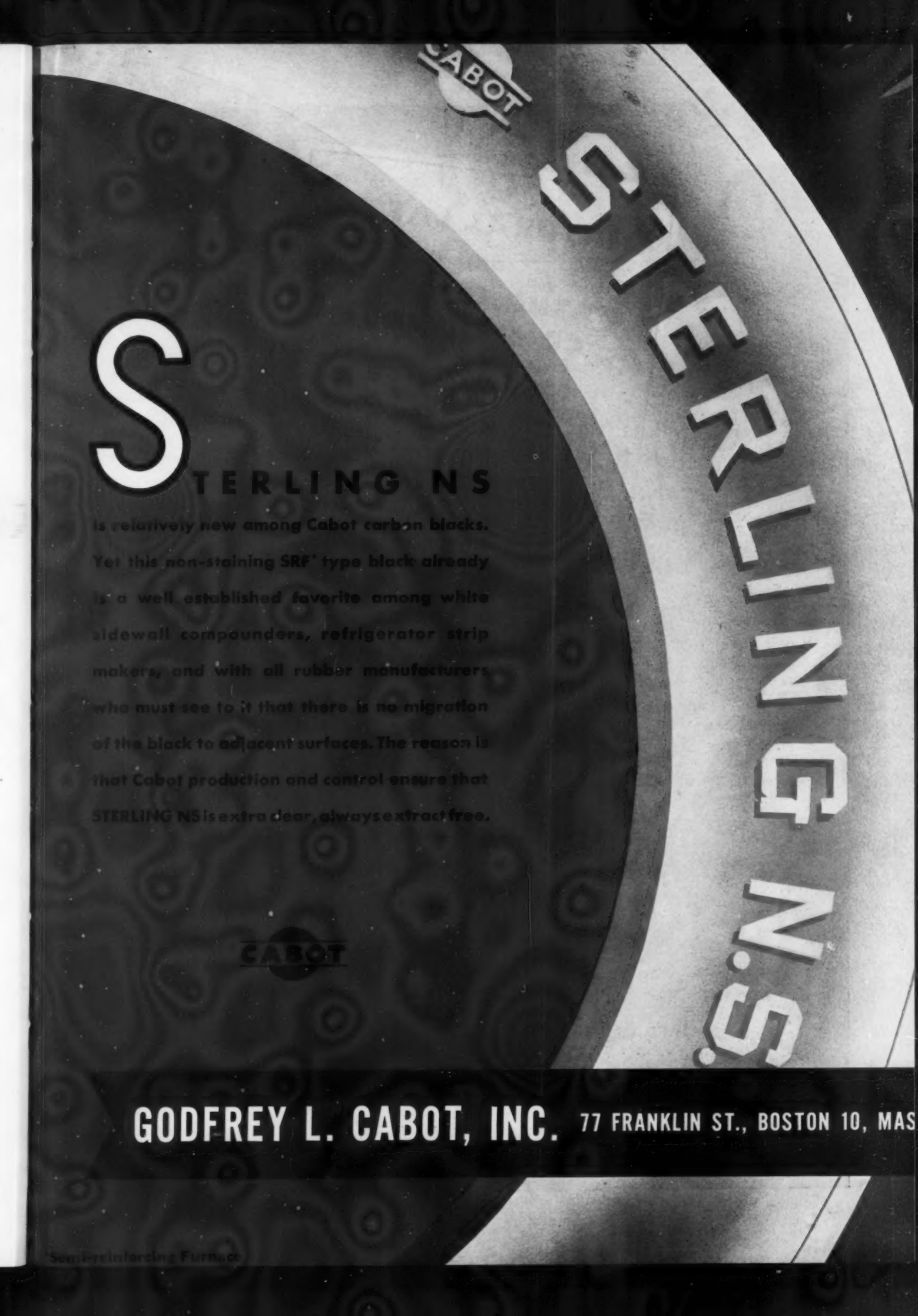
SCHRADER PRODUCTS Make Tires Last Longer!

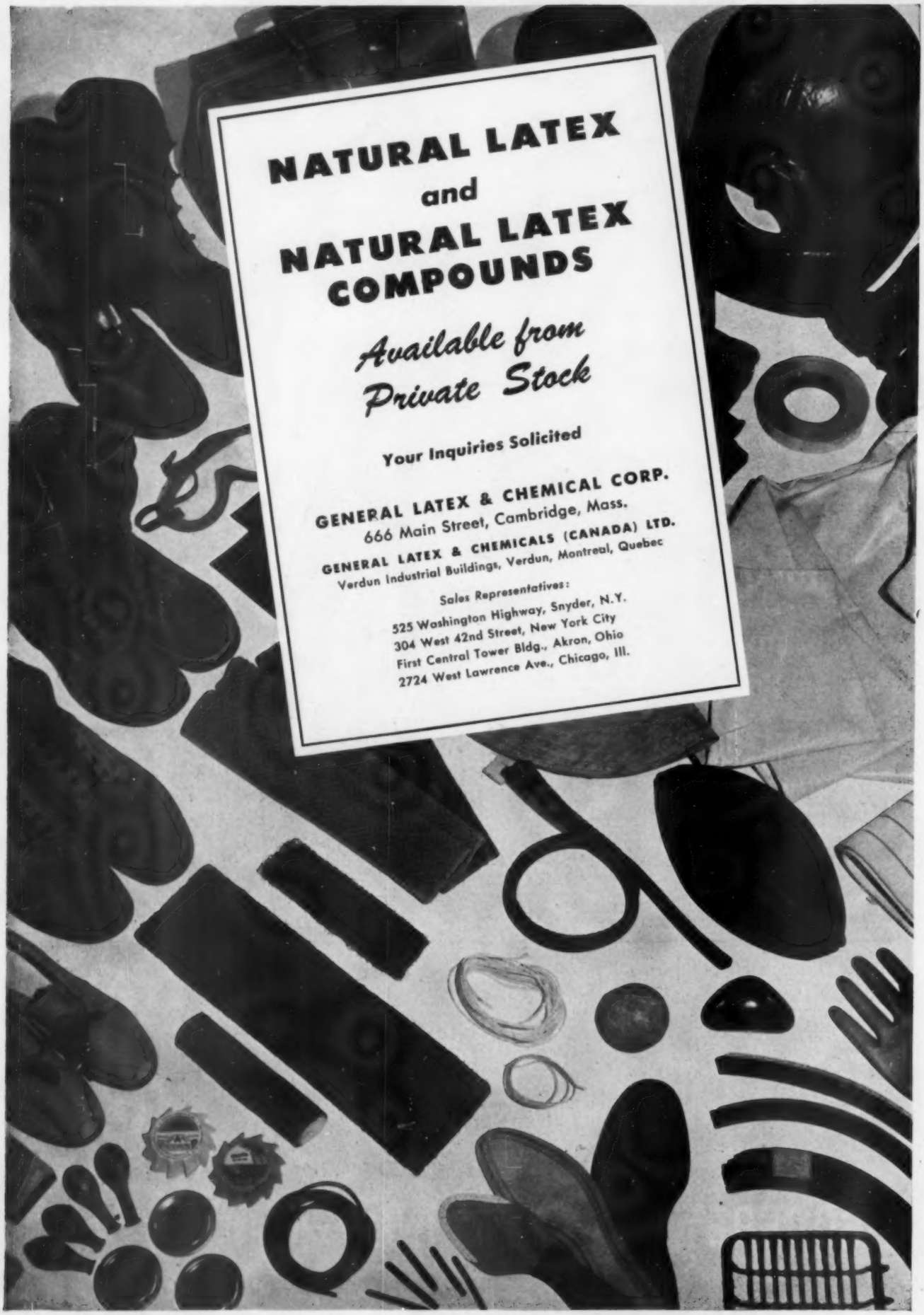
Schrader
REG. U.S. PAT. OFF.
PRODUCTS
CONTROL THE AIR

A CATALOG OF A COMPLETE TIRE SERVICE

If you have not received your copy of Schrader Catalog No. 48-A, write today to Box No. 240, General Post Office, Brooklyn 1, N. Y.

A. SCHRADER'S SON, *Division of Scovill Manufacturing Company, Incorporated,* **BROOKLYN 17, NEW YORK**

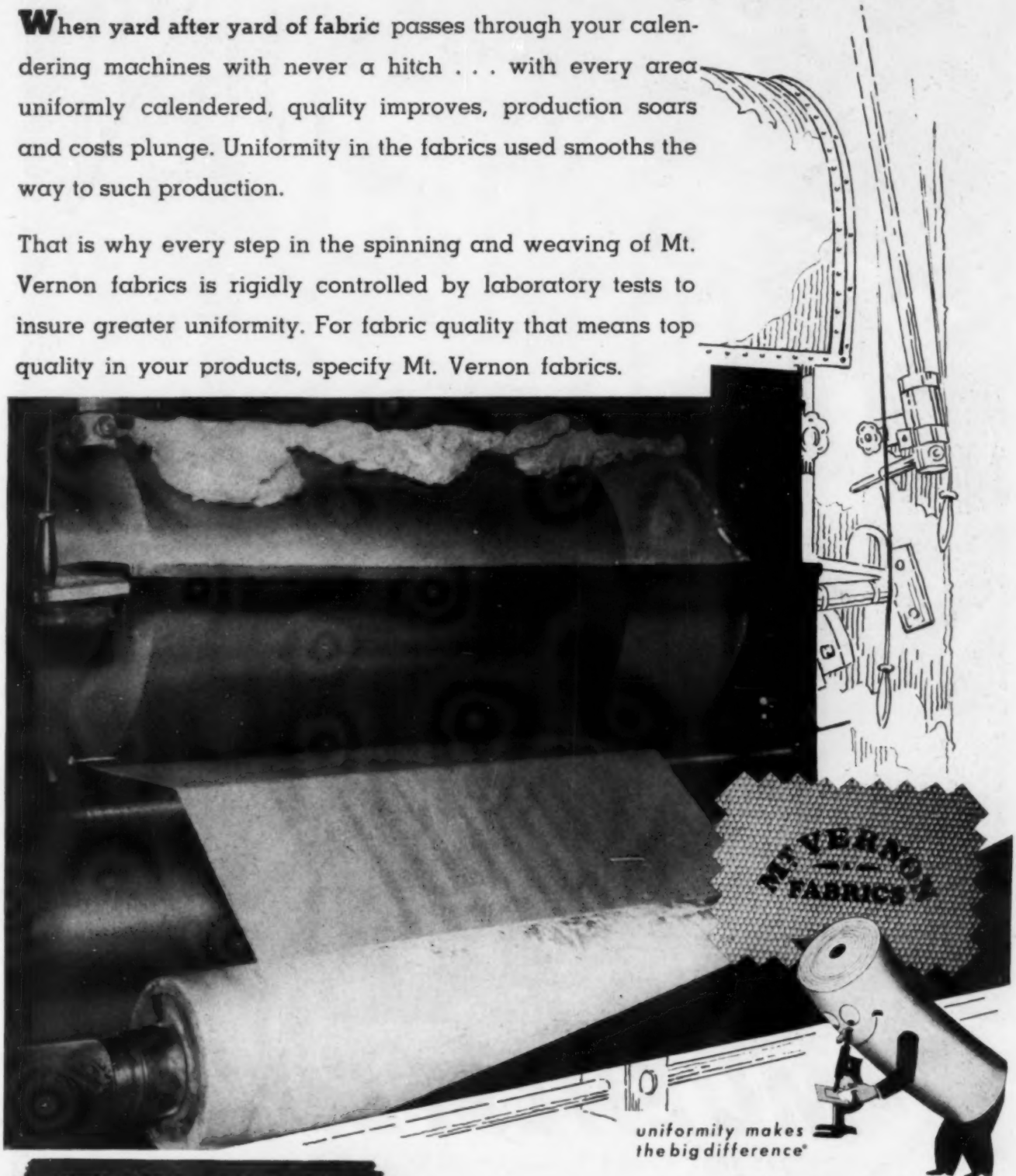

CABOT
STERLING N.S.
STERLING NS
is relatively new among Cabot carbon blacks. Yet this non-staining SRF* type black already is a well established favorite among white sidewall compounders, refrigerator strip makers, and with all rubber manufacturers who must see to it that there is no migration of the black to adjacent surfaces. The reason is that Cabot production and control ensure that STERLING NS is extra clear, always extract free.
CABOT
GODFREY L. CABOT, INC. 77 FRANKLIN ST., BOSTON 10, MAS
*Semi-reinforcing Furnace


NATURAL LATEX
and
NATURAL LATEX
COMPOUNDS
Available from
Private Stock
Your Inquiries Solicited
GENERAL LATEX & CHEMICAL CORP.
666 Main Street, Cambridge, Mass.
GENERAL LATEX & CHEMICALS (CANADA) LTD.
Verdun Industrial Buildings, Verdun, Montreal, Quebec
Sales Representatives:
525 Washington Highway, Snyder, N.Y.
304 West 42nd Street, New York City
First Central Tower Bldg., Akron, Ohio
2724 West Lawrence Ave., Chicago, Ill.

Fabric Uniformity Smooths the Way

When yard after yard of fabric passes through your calendering machines with never a hitch . . . with every area uniformly calendered, quality improves, production soars and costs plunge. Uniformity in the fabrics used smooths the way to such production.

That is why every step in the spinning and weaving of Mt. Vernon fabrics is rigidly controlled by laboratory tests to insure greater uniformity. For fabric quality that means top quality in your products, specify Mt. Vernon fabrics.



TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. • NEW YORK

Mt. Vernon-Woodberry Mills

Branch Offices: CHICAGO • ATLANTA • BALTIMORE • BOSTON • LOS ANGELES • AKRON

MUEHLSTEIN
Any way you look at it... it's the First Name in Scrap Rubber
H. MUEHLSTEIN & CO. INC.
122 EAST 42nd STREET, NEW YORK 17, N. Y.
BRANCH OFFICES: Akron • Chicago • Boston • Los Angeles • Memphis
WAREHOUSES: Jersey City • Akron • Boston • Los Angeles • Memphis

FIRST EDITION *NOW AVAILABLE!*

COMPLETE DESCRIPTIONS OF SHARPLES DOUBLE-CHECKED ✓✓ CHEMICALS FOR THE RUBBER INDUSTRY

If you have not received a copy, we will mail yours upon request.

SHARPLES TRADE ✓✓ MARK CHEMICALS

SHARPLES CHEMICALS INC. PHILADELPHIA · NEW YORK · CHICAGO · AKRON

DOUBLE-CHECKED CHEMICALS FOR THE RUBBER INDUSTRY

SALES OFFICES

PHILADELPHIA • NEW YORK • AKRON • CHICAGO

WEST COAST

MARTIN, HOYT & MILNE, INC.
Los Angeles, San Francisco, Seattle, Portland

CANADA

SHAWINIGAN CHEMICALS LTD.
Montreal, Quebec—Toronto, Ontario

EXPORT

AIRCO EXPORT CORP.
New York City

WAREHOUSES

BOSTON, MASS. • TRENTON, N. J. • AKRON, OHIO
CHICAGO, ILL. • LOS ANGELES, CAL. • SAN FRANCISCO, CAL.

SHARPLES CHEMICALS INC.

This Can't Happen

When You Use

PELLETEX

Extra Clear

It's Non-Staining!

Stains are just as unpopular on porcelain refrigerators as on an evening gown. Manufacturers of household appliances, automotive equipment, insulated wire, and other products requiring S R F Black in the compound, can eliminate staining by simply specifying

PELLETEX Extra Clear

Costs you no more.

Immediately Available.

Recommended for

Tire Sidewalls

Refrigerator Gaskets

Automotive Molded and Extruded Parts

Insulated Wire

Boots and Shoes

Rubber Coated Fabrics

MANUFACTURER

GENERAL ATLAS CARBON CO.

PELLETEX

GASTEX

PAMPA, TEXAS

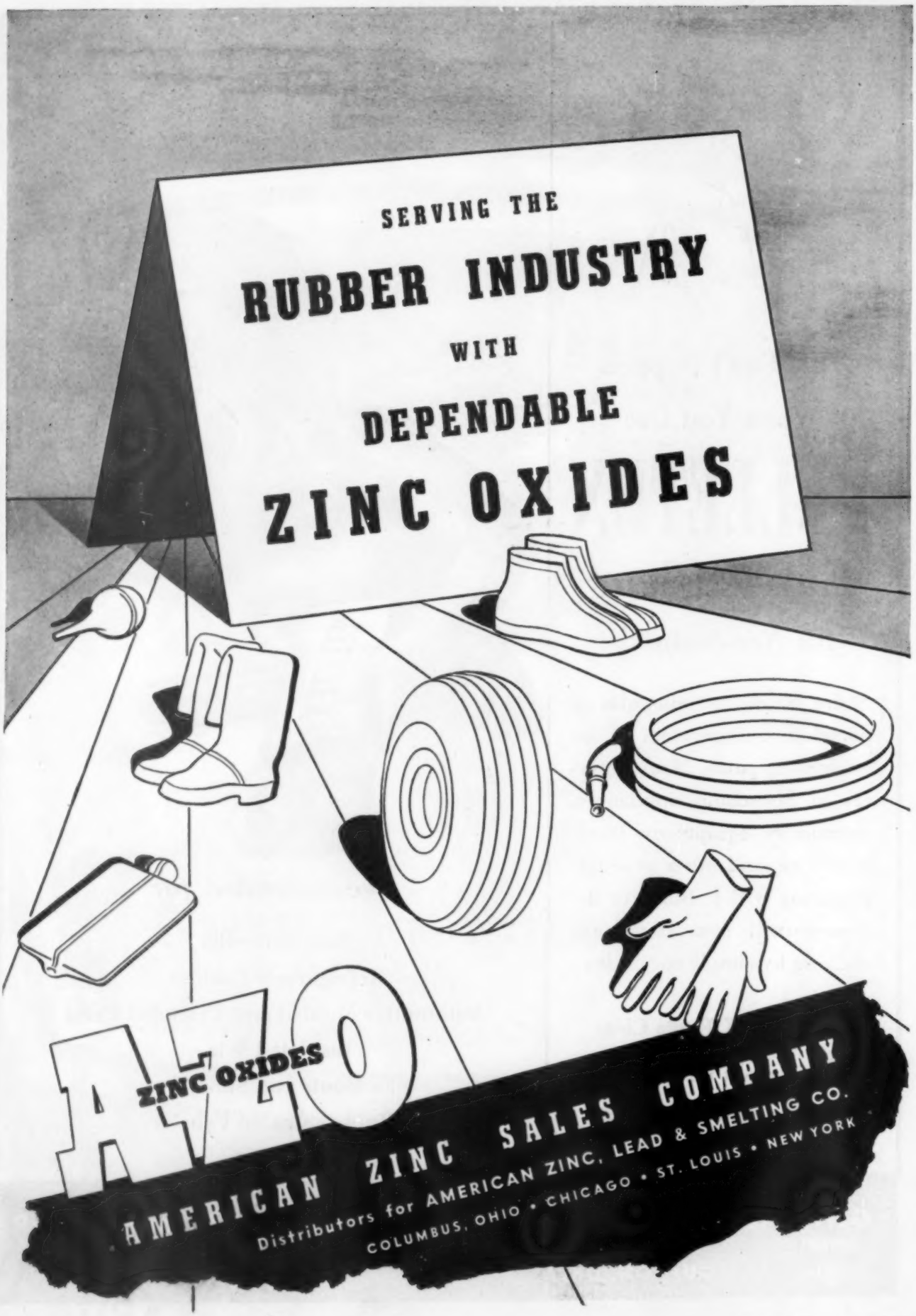
GUYMON, OKLA.

DISTRIBUTOR

HERRON BROS. and MEYER

NEW YORK, N. Y.

AKRON, OHIO


SERVING THE
RUBBER INDUSTRY
WITH
DEPENDABLE
ZINC OXIDES
AZO
ZINC OXIDES
AMERICAN ZINC SALES COMPANY
Distributors for AMERICAN ZINC, LEAD & SMELTING CO.
COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

SHELL DUTREX® 15

Modified Asphaltic-Type Softener for GR-S and Natural Rubber Friction and Tread Stocks

SHELL®

Direct inquiries to:

SHELL OIL COMPANY, INCORPORATED

50 WEST 50th ST., NEW YORK 20, N. Y.
(East of Rockies Territory)

100 BUSH ST., SAN FRANCISCO 6, CALIF.
(Pacific Coast Territory)

SHELL OIL COMPANY OF CANADA, LTD., 25 ADELAIDE ST., EAST
TORONTO, CANADA

Straight to the Point . . .

Banbury Users in ever increasing numbers are learning that Interstate service dependably meets the need for skillful repairing, rebuilding and hard-surfacing . . . Interstate is an organization of experts who have specialized in their work on Banburys for the Rubber Industry. Through their craftsmanship hundreds of these mixers, from the smallest to the largest, have been maintained or restored to maximum efficiency.

Our Service SAVES YOU Time, Trouble, And Money

1. Correct contours restored to worn rotors. **2.** Rotors and mixing chamber made amazingly resistant to abrasion by our exclusive hard-surfacing process. **3.** Worn rings replaced by our own specially fabricated rings. **4.** New bearings, new oil tubes, packing, etc. **5.** Every job has the benefit of our more than a dozen years of specialized experince on this work.

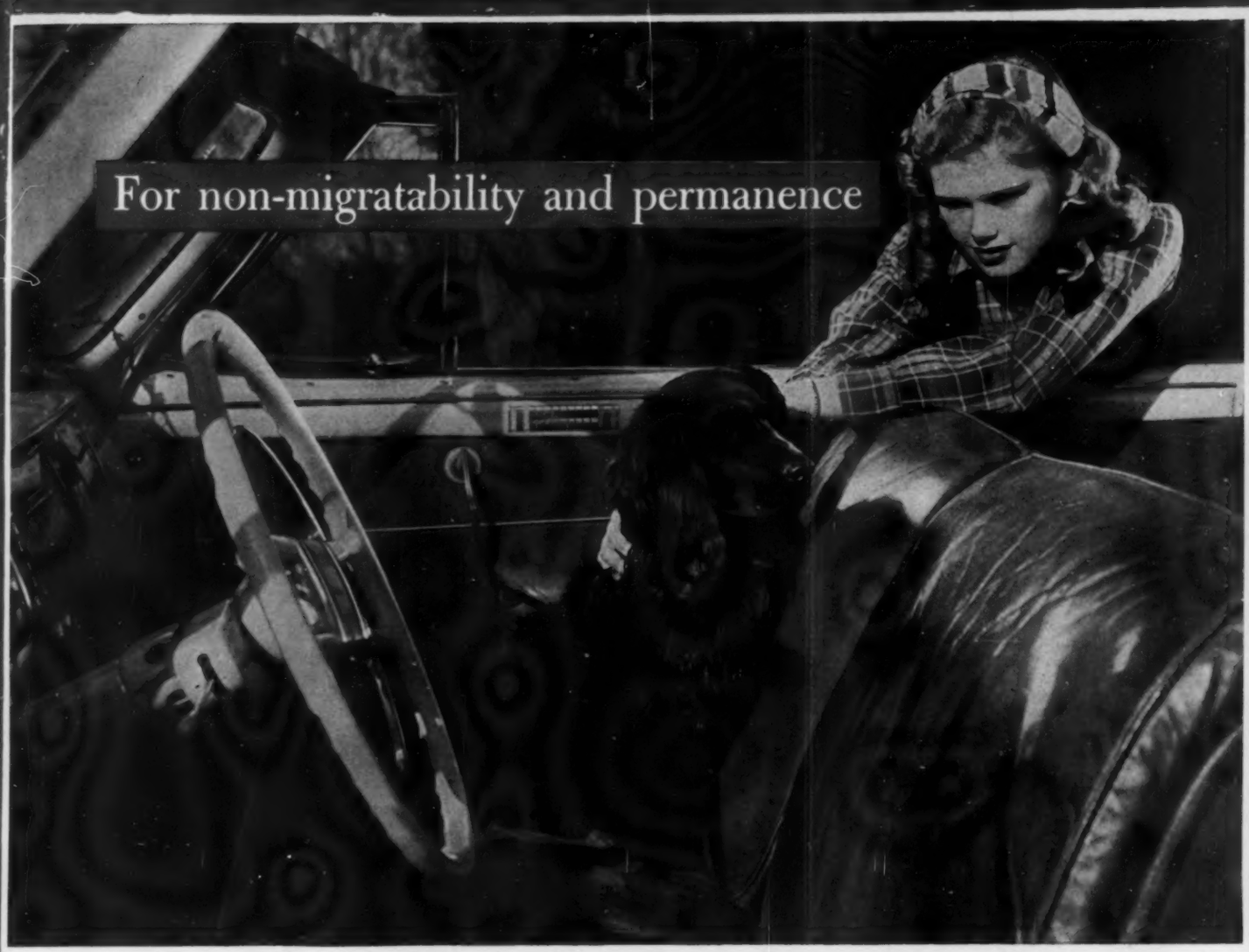
For Quick Estimates on repairing or rebuilding YOUR worn Banburys just write, wire, or phone.

SERVING THE IWS RUBBER INDUSTRY

INTERSTATE WELDING SERVICE

Main Plant: 914 Miami Street . . . AKRON, OHIO . . . Phone: JE 7970

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING



. . . plasticize your vinyl compounds with dependable PARAPLEX G-25

When long, hard service is required of vinyl compounds, you can rely on the outstanding non-migratability and permanence of PARAPLEX G-25. This unusual resinous plasticizer has proved itself invaluable in such applications as coated fabrics, upholstery, simulated leather, luggage, and free films for a variety of uses.

PARAPLEX G-25 can improve your products by giving them the following advantages:

1. *Permanence*
2. *Non-migratability*
3. *Low flammability*
4. *Flexibility at low temperatures*
5. *Heat stability*
6. *Non-extractibility*
7. *Freedom from odor and taste*
8. *Resistance to weathering and ultra-violet*

We also manufacture a series of MONOPLEX esters, which meet specialized requirements. If you are working with vinyl compounds, we'll be glad to give you technical assistance in selecting the proper plasticizers to suit your needs.

PARAPLEX *is a trade-mark, Reg. U.S. Pat. Off.*

Represented by Cia. Rohm y Haas, S.R.L. Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Tread sections vary less than 1/8"

when cut on the new

NRM TREAD SKIVER

WHY *recut* your tread sections! With the new NRM Tread Skiver you get *precision* cutting—with less than ⅛ of an inch variation in length of tread sections.

The big 20" blade cuts smoothly, precisely, on the fly *in one direction only.* This clean, steep-angle cut of each skive assures perfect matching and a greater surface for vulcanizing, and can be varied in pitch from 15° to 45°.

The cutter carriage starts slowly as the blade cuts through the thinner section of the tread, gathers speed through the thicker center, then diminishes speed again at the other thinner edge.

For a complete technical description of the new NRM Model 46 Tread Skivers for 24" or 36" belt width, and records of performance in actual production, write to us today.

NATIONAL RUBBER MACHINERY CO.

General Offices: AKRON 8, OHIO

Creative Engineering

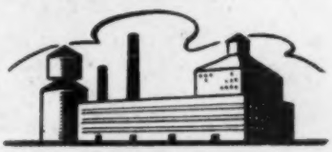
Rubber-Flo IS THE ANSWER FOR KEEPING MOLDS CLEAN...

Rubber-Flo MOLD LUBRICANT WILL HELP YOU "LICK" YOUR PRODUCTION PROBLEMS

PLANT "A"

Plant "A" manufactures mechanical rubber goods. Production is unsteady . . . maintenance costs are high. Factory records show that several times a month, sometimes once a week, the molds are shut down and allowed to cool so that they can be cleaned. Plant "A" is losing production because an ordinary mold lubricant won't keep the molds clean.

PLANT "B"



Plant "B" manufactures rubber soles and heels as well as mechanical rubber goods. Their production, too, was uneven . . . showed ups and downs . . . until a chemist suggested **RUBBER-FLO** Mold Lubricant to keep the molds clean. Now, after a full year's operation, the molds are still clean, *with not a single shut-down!*

- *Rubber-Flo* is SAFE! It is a non-toxic, odorless mold lubricant.
- *Rubber-Flo* is QUICK! It may be sprayed, brushed or dripped onto the mold. It will not clog a spray gun.
- *Rubber-Flo* is ECONOMICAL! The savings in maintenance more than pays for it.
- *Rubber-Flo* is LOW IN COST! It comes in concentrated form and is diluted with water for use.

For softening synthetic and natural rubber use *RUBBER-SOL*

RUBBER-SOL is a safe, non-toxic, non-explosive liquid.

RUBBER-SOL removes rubber, gum, varnish, paint and carbon from metal without any harm to the metallic surface.

PREVENTIVE MAINTENANCE COMPANY

1997 FAIRFIELD AVE. BRIDGEPORT 5, CONNECTICUT

Mail this coupon today for a free sample and further information

Name

Address

Without obligation to me, please send further information and samples of

Rubber-Flo

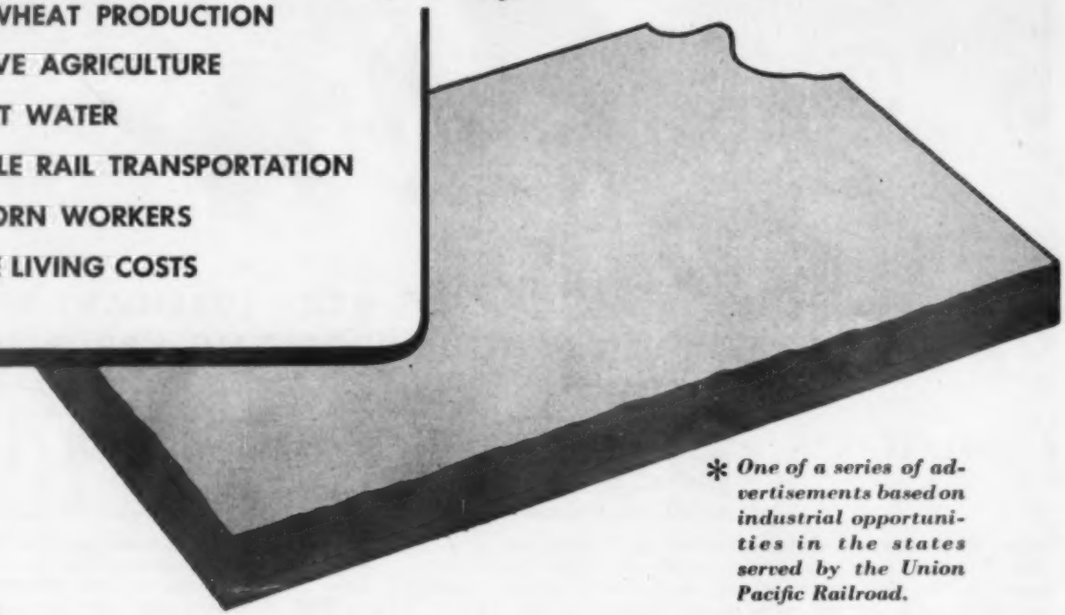
○ ○ RUBBER-SOL

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Kansas *

RICH NATURAL RESOURCES
CENTER OF NATIONWIDE MARKET
PROGRESSIVE INDUSTRY
FIRST IN WHEAT PRODUCTION
PRODUCTIVE AGRICULTURE
ABUNDANT WATER
DEPENDABLE RAIL TRANSPORTATION
NATIVE BORN WORKERS
MODERATE LIVING COSTS



* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

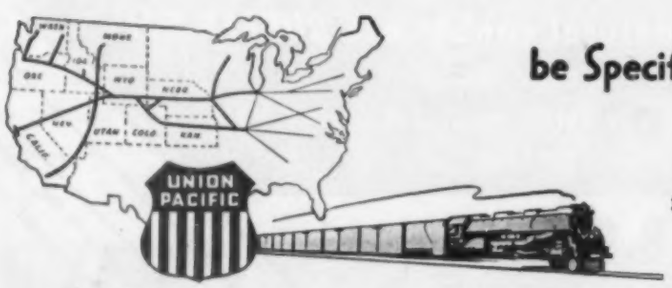
KANSAS—almost in the exact geographical center of the United States; an important factor to industries serving nationwide markets.

Agriculture is king. Kansas normally ranks first in wheat production. In addition to grains, vegetables and fruits, a large part of farm income is derived from livestock and poultry.

Kansas industry keeps step with agriculture. There are approximately 2,500 manufacturing and processing establishments. Over four million tons of coal are mined annually. Here is the largest natural gas field in the world. Eighteen principal rivers with two great watersheds provide an abundance of water. The population is 97 per cent native born.

★ ★ ★

Kansas . . . the hub of a rich market; a treasure chest of natural resources with dependable labor; outstanding public health record; moderate living costs; and excellent transportation over Union Pacific rails.



be Specific – say

"Union Pacific"

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

Something New — Something Different

For The RUBBER INDUSTRY

60

UNITED CARBON COMPANY, INC.

CHARLESTON 27, W. VA.

NEW YORK • AKRON • CHICAGO • BOSTON

KOSMOS 60—DIXIE 60 . . . . . .

is something new, something different, something better in carbon black.

DIXIE 60—KOSMOS 60 . . . . . .

is a United furnace process carbon black. It possesses high structure, is powerful, active, and unbelievably good for rubber treads, both natural and synthetic.

KOSMOS 60—DIXIE 60 . . . . . .

is acclaimed for faster and smoother processing, high extrusion efficiency, less rejects at tuber, low shrinkage, glassy smoothness, dense appearance, freedom from ragged edges, and for remaining tackier longer.

DIXIE 60—KOSMOS 60 . . . . . .

is a fast curing black requiring low acceleration.

KOSMOS 60—DIXIE 60 . . . . . .

is an unusually high modulus black with outstanding reinforcement so essential for resistance to tread wear, cracking and cut growth.

DIXIE 60—KOSMOS 60 . . . . . .

assures excellent performance under the severest conditions.

Available only in limited quantities for the present

UNITED CARBON COMPANY, Inc.

CHARLESTON, WEST VIRGINIA

Here's another interesting use for American Anode latices and mixes

Do these toys suggest any new—and profitable—products that you might make from latex?

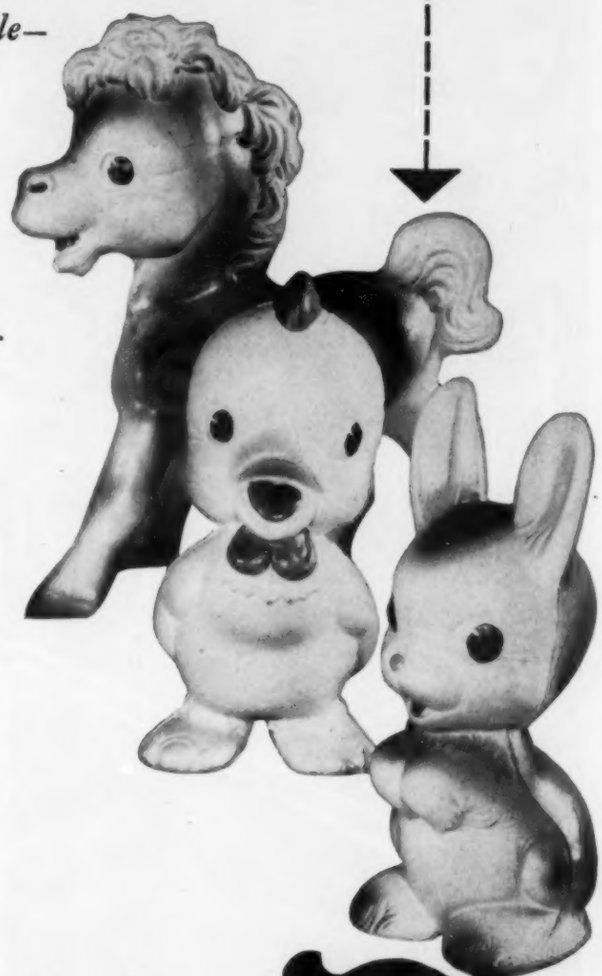
THESE rubber toys are just one of the scores of new and interesting things that have been done recently with American Anode latices and mixes.

And they're only an indication of the many added things that *will* be done with these materials in the future.

Do you have an idea for a new product—or an improvement of an old one? If so, don't assume it can't be done with latex until you've consulted with American Anode development men.

Rubber toys—industrial adhesives; surgical catheters—paper impregnants; meteorological balloons—metal coatings. These few uses show the broad range of possibilities for American Anode latices and mixes.

Latices and compounded mixes of GEON, HYCAR, Saran, neoprene, crude rubber and GR-S are available. For more information about these modern materials—*and proper methods of using them*, please write Department AG-4, American Anode Inc., 60 Cherry St., Akron, Ohio.

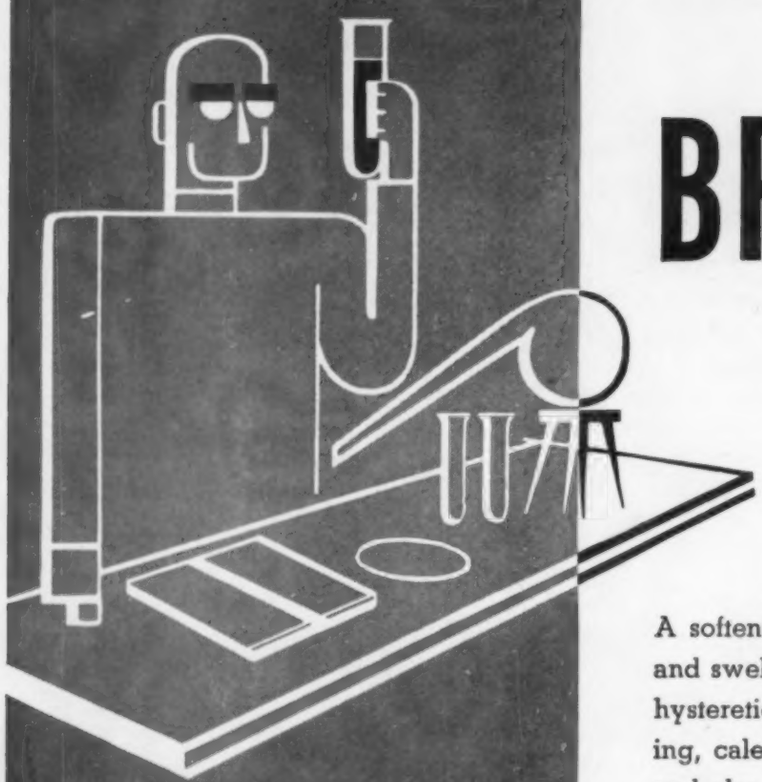


Toys manufactured by Rempel Mfg., Inc.

AMERICAN ANODE
INCORPORATED

Crude and American Rubber Latices, Water Cements and Suspensions

FROM THE CATALOG OF BARRETT RUBBER COMPOUNDING MATERIALS...



BRS 700

This recent addition to the Barrett Rubber Compounding Materials line is a black viscous fluid refined from coal tar.

A softener and extender of the solvent and swelling type, BRS 700 confers good hysteretic properties, improves processing, calendering and tubing properties, and also improves resistance to tear and crack-growth. Its principal use is in tire treads and mechanical goods. It is inexpensive and very easy to handle.

Inquiries are invited. Send for Barrett Rubber Laboratory Release No. 4 which contains sample recipes using BRS 700.

Available in drums and tank cars.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

In Canada: The Barrett Company, Ltd.,
5551 St. Hubert Street, Montreal, Que.

*Trade-mark Reg. U. S. Pat. Off.

Barrett*

BUTAPRENE NAA WITHSTANDS AMAZING HEAT TEST... RESISTS 300°F FOR 70 HOURS

IS HEAT RESISTANCE YOUR PROBLEM? Then Butaprene NAA is your answer. Look at the results of this amazing heat test. Aged in air tubes for 70 hours at 300 degrees F., Butaprene NAA actually showed an *increase* in tensile, practically *no* durometer change—properties of inestimable value in gaskets, diaphragms and other rubber parts where disintegration due to high heat is a serious factor.

Extreme heat resistance is just another PLUS feature of Butaprene NAA. For the complete story on this newest and most versatile of the Butaprene N family, write Xylos Rubber Company, Distributors, Akron 1, Ohio.

•

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1947, The Firestone Tire & Rubber Co.

FORMULA

R-9602-B

Butaprene NAA	100.0
Medium Thermal Black	115.0
Antioxidant	5.0
Zinc Oxide	5.0
Tetrone A	1.25
Santocure	1.25

HEAT TEST

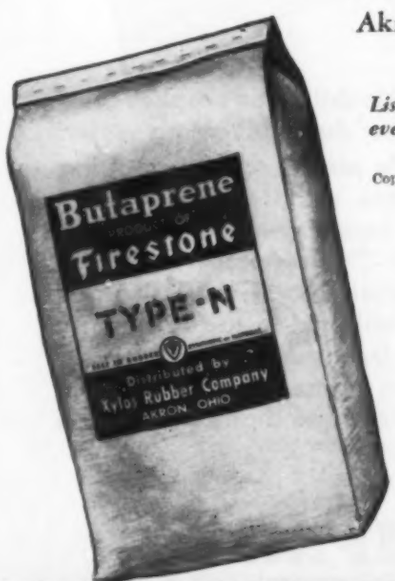
Slabs cured 20 minutes at 312° F.

Original Properties

Tensile	1390
Elongation	535
Durometer	66

Aged in Air Tubes 70 hours at 300° F.

Tensile	1450
Elongation	225
Durometer	68
Flexibility	Very good

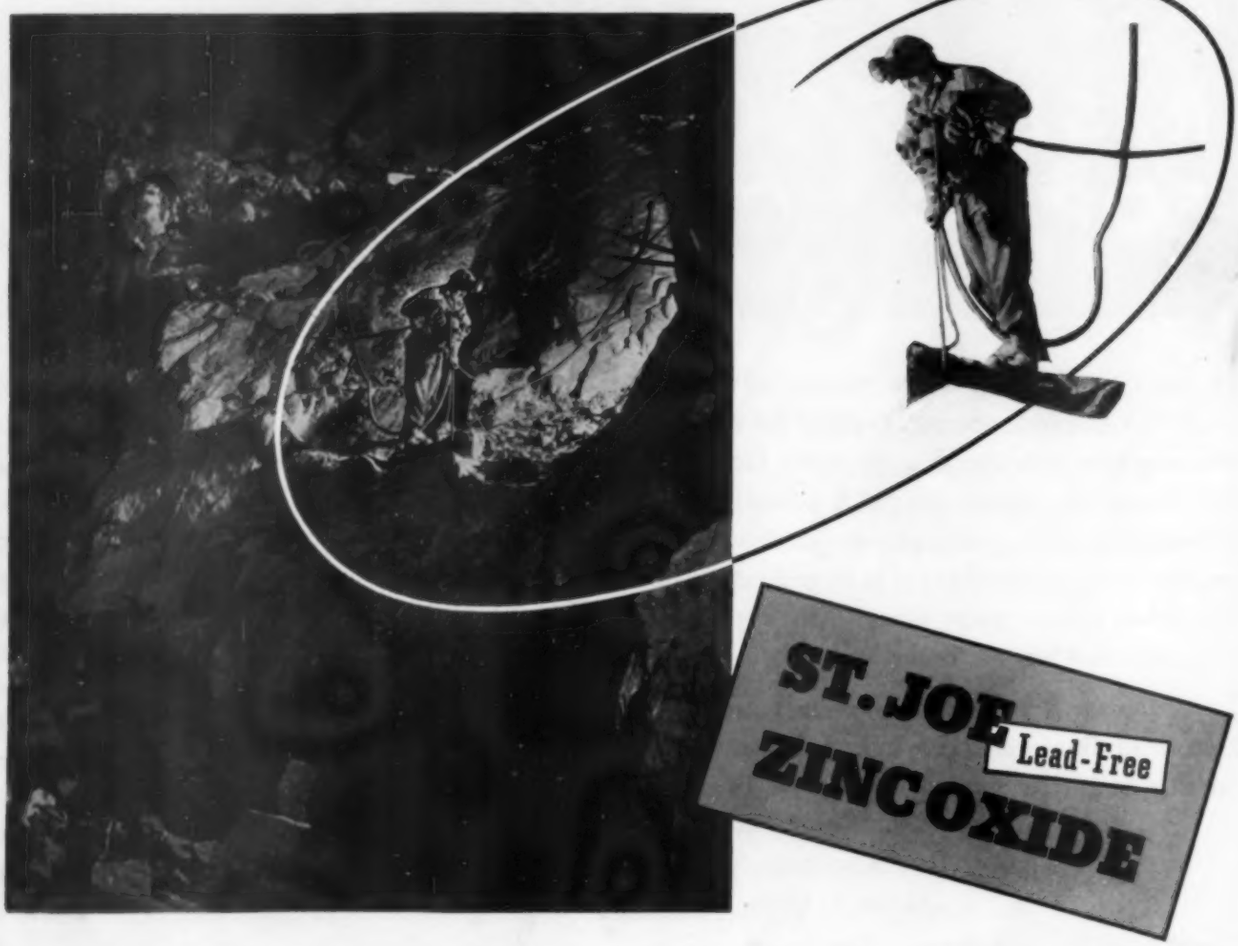


BUTAPRENE N by Firestone

AMERICA'S MOST VERSATILE ELASTOMER

ORE, AIR, WATER, DRILL and *Skill*

...Essential Production Tools
in the Manufacture of ZnO



ST. JOE Lead-Free
ZINC OXIDE

One of the key men in mining is the drill runner, with a keen eye for pay ore and a knowledge born of long experience for the proper placing of holes to ensure the minimum of time and dynamite consumed.

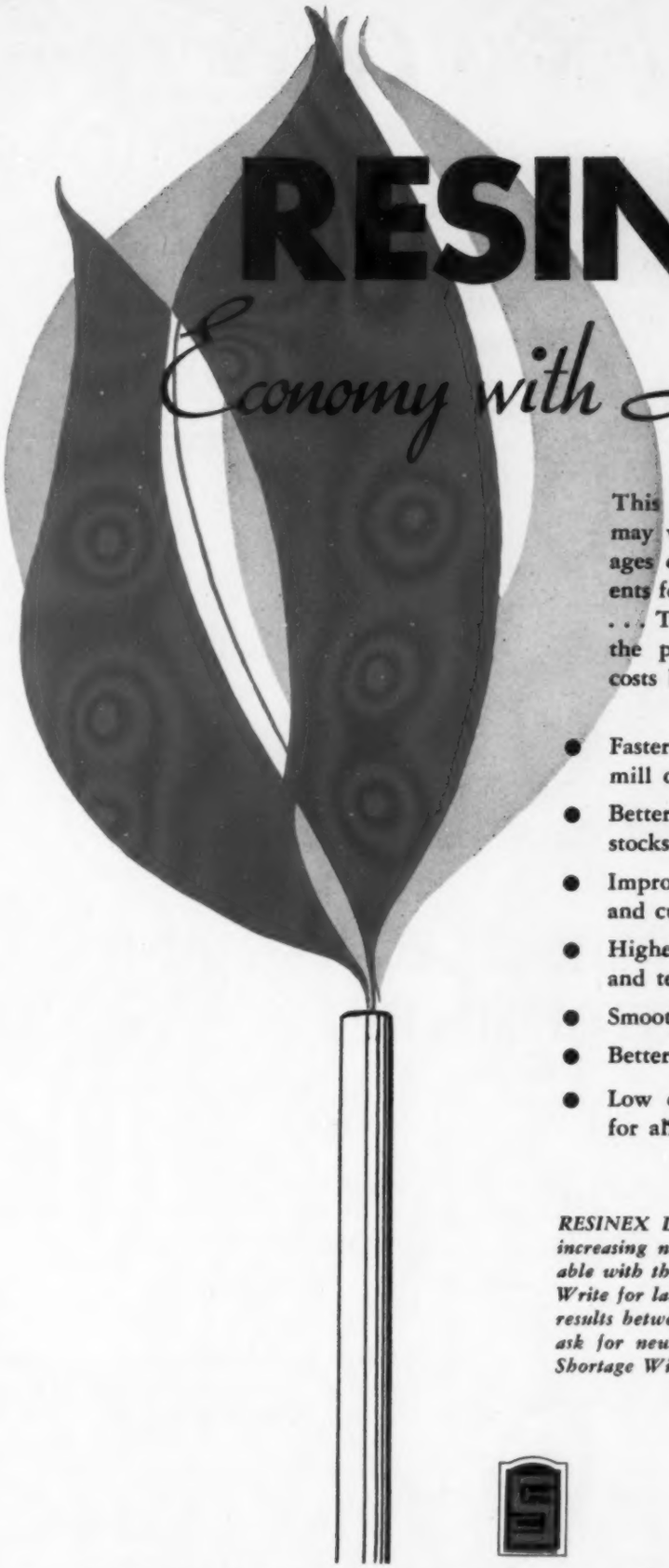
This photo shows a drillman at work in a stope of one of the St. Joseph Lead Company's zinc mines in upper New York State where ST. JOE lead-free ZINC OXIDES originate. He works 500 to 2,000 feet underground in a year-round average temperature of 60°F. Two hoses connect with his drill. One supplies compressed air, the other dust-preventing water.

After the ore is duly processed, the resulting zinc concentrates are shipped to the Company's smelter at Josephtown, Pa. Here, by our patented Electro-Thermic process, the concentrates are converted into ST. JOE lead-free ZINC OXIDES and shipped to the consuming industries where—by virtue of their uniform high quality—these pigments, in turn, add to the inherent quality of the many products in which they are used.

ST. JOSEPH LEAD COMPANY

250 PARK AVENUE • NEW YORK 17 • ELdorado 5-3200

Plant & Laboratory: Josephtown, Beaver County, Pennsylvania



RESINEX

Economy with Availability

This polymerized aromatic resin series may well bring you relief from shortages of supposedly "essential" ingredients for your compounding needs today. . . . The RESINEX series can help ease the pressure of mounting production costs by giving you an extender for —

- Faster and easier incorporation in open mill or Banbury mixing.
- Better pigment dispersion and smoother stocks.
- Improved resistance to flex-cracking and cut-growth.
- Higher tensile with better elongation and tear properties.
- Smoother extrusion.
- Better mold flow with less sticking.
- Low cost with immediate availability for all purposes.

RESINEX L-4, for instance, is being used in an increasing number of plants with results comparable with the best of the old-line rubber softeners. Write for laboratory bulletin showing comparative results between Pine Tar and RESINEX L-4. Also, ask for new bulletin: "Facing the Carbon Black Shortage With Resinex."

HARWICK STANDARD CHEMICAL CO.

AKRON 8, OHIO

Branches: Boston . . . Trenton . . . Chicago . . . Los Angeles

As a Service to Our Customers—

WE DO MASTER BATCHING AND CUSTOM MIXING

Along with our regular business of manufacturing dependable grades of reclaimed rubber, we render auxiliary services to manufacturers who require them. For example —

Many concerns make use of Pequanoc's facilities to supplement their own for master batching and mixing, when breakdowns occur or when sudden large production requirements make it necessary to augment their own equipment.

If you wish to learn how this works out, write our plant at Butler, New Jersey.

PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

MAIN OFFICE and FACTORY — **BUTLER, NEW JERSEY**

New England Representative
HAROLD P. FULLER
203 Park Square Bldg.
Back Bay, Boston, Mass.

Trenton Representative
W. T. MALONE
General Supply & Chemical Co.
28 Woolverton Avenue
Trenton, N. J.

R. D. WOOD 3400-TON TWO-OPENING PLATEN PRESS

For

VULCANIZING and CURING
RUBBER COMPOSITION SHEET PACKING,
FLOOR TILE, and RUBBER BELTING

Newest member of the R. D. Wood "Press Family" is this Two-Opening Multiple Cylinder Type Hydraulic Steam Platen Press. Designed for vulcanizing and curing rubber composition sheet packing, or floor tile; also, with the addition of stretching and clamping units, adaptable for vulcanizing rubber belting.

Top and bottom platen members are of sectional construction. The one-piece moving platen is made from open hearth steel casting, with movement guided to assure the proper adjustment to compensate for expansion and contraction under changing temperatures. Intermediate steam platen is column guided, suspended by means of steel hanger rods, and accurately spaced with press in open position. Various press sizes and capacities can be furnished to meet product requirements. If you want more details, or engineering advice, ask R. D. WOOD COMPANY, Independence Square, Philadelphia 5, Pa.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ATTENUATORS • INTENSIFIERS

R.D. Wood Company

EST. 1803

TO MEET THE GROWING INDUSTRIAL DEMAND...

AERO BRAND STEARATES

CALCIUM ... ZINC ... ALUMINUM ... MAGNESIUM

CYANAMID'S large-capacity, rigidly controlled manufacturing facilities offer exceptional advantages as your source of supply. Thorough inspection and meticulous control at each step from the acid to the final packaged product bearing the AERO* BRAND Seal make certain that your stearates will be fine and fluffy ... with clean, smooth dusting lube qualities ... and possessing the many other superior diversified processing characteristics inherent in each type. For product quality ... for service ... for all-around dependability ... it's CYANAMID AERO BRAND STEARATES.

CYANAMID'S MODERN FACILITIES BECOME YOUR DEPENDABLE SOURCE OF SUPPLY WHEN YOU SPECIFY...

AERO BRAND STEARATES

Industrial Chemicals Division

AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.

*Trade Mark

ANNOUNCING
a new plant for production of

"FLEXOL" TOF
TRADE-MARK

TRI-2-ETHYLHEXYL PHOSPHATE

"Flexol" plasticizer TOF effectively produces compositions having these four desirable properties:

1. Excellent low-temperature flexibility.
2. Minimum change in flexibility over a wide temperature range.
3. Resistance to water extraction.
4. Low volatile loss.

A new plant unit for the production of "Flexol" plasticizer TOF is now in operation. If your product is a resin coating, or a molded, calendered, or extruded composition it will be worth while to investigate the properties of this new and unusual plasticizer.

"Flexol" TOF imparts unusual low temperature flexibility to plasticized compositions without sacrificing compatibility, resistance to water extraction or permanence. TOF is readily compatible with the vinyl resins commonly used in the production of unsupported film or coated cloth. Laboratory tests indicate that this plasticizer is also fully compatible with ethyl cellulose and yields a composition having high impact resistance. TOF is an excellent plasticizer for neoprene and nitrile type synthetic rubber especially where low temperature flexibility is required.

Write or call our nearest office for technical data on this and other plasticizers we supply, please address Dept. N-7.

COMPATIBILITY OF "FLEXOL" PLASTICIZER TOF WITH VARIOUS RESINS

Resin	Ratio of Resin to Plasticizer		
	1:1	4:1	9:1
"Vinylite" Chloride-Acetate Resin VYNW	C	C	C
"Vinylite" Chloride-Acetate Resin VYHH	C	C	C
"Vinylite" Butyral Resin XYNC	C	C	C
"Vinylite" Acetate Resin AYAT	I	I	I
"Geon" 100 Series	C	C	C
Cellulose Nitrate	C	C	C
Cellulose Acetate	I	SI	SI
Cellulose Acetate-Propionate	SI	C	C
Cellulose Acetate-Butyrate	I	SI	C
Ethyl Cellulose	C	C	C

C—Compatible I—Incompatible
SI—Slightly Incompatible

CARBIDE AND CARBON CHEMICALS CORPORATION
Unit of Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N. Y. Offices in Principal Cities
Distributed in Canada by Carbide and Carbon Chemicals, Limited, Toronto

The words "Flexol" and "Vinylite" are registered trade-marks of Carbide and Carbon Chemicals Corporation.

Get Rid of the "DUST NUISANCE"-
INVITE MAN POWER!

GLYCERIZED
(LIQUID CONCENTRATE)
LUBRICANT

....GLYCERIZED eliminates annoying "DUST" arising from the use of talc, soapstone, whiting or clay. A clean mill room, free from dust, is the goal of every rubber manufacturer. *Make your mill room a healthful, inviting place to work in by doing away with all 'dust'.*

....Banbury or mill mixed stocks may be dipped in a 2 to 5% water solution of GLYCERIZED LUBRICANT for 10 to 30 seconds and hung on racks to cool and dry. After 30 to 40 minutes, the slabs are cool and dry enough to pile. GLYCERIZED reduces the surface tension of the water and insures complete wetting of the surface of the slab. Adhesion is nullified!

....Use GLYCERIZED in your extruding operations—as a mold lubricant—for coating mandrels and cores—belt drums—air bags—washing and finishing inner tubes—processing of insulated wire and cable—all with gratifying results.

....GLYCERIZED *is adapted to all types of synthetic rubbers as well as to natural rubber, reclaim or mixtures!*

GET THE GENUINE from GENSEKE

AVAILABLE ONLY IN DRUMS AND HALF DRUMS.

QUALITY SINCE 1864

GENSEKE BROTHERS

RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street Chicago 32, U.S.A.

READY TO OPERATE . . . AVAILABLE NOW
SIX-BURNER UNIT
CHANNEL-TYPE
CARBON BLACK PLANT
PLANCOR 2277
SUNRAY, MOORE COUNTY, TEXAS
FOR SALE OR LEASE
FOR SALE*
(1) As a whole, for operation at present site; (2) as a combination of burner units, plus appropriate accessory buildings and equipment for operation at present site, or—
(3) As a whole, except dwellings for dismantling and removal from site; (4) any combination of burner units, plus appropriate accessory buildings and equipment for dismantling and removal from site.
*If the entire plancor except dwellings, not offered at this time, is sold for dismantling and removal from site, the dwellings will be offered at a later date.
War Assets Administration invites proposals for the purchase or lease of Plancor 2277, a channel-type carbon black plant now being operated by Continental Carbon Company at Sunray, Moore County, Texas.
DESIGNED CAPACITY: Approximately 20,000,000 pounds of carbon black per year.
BUILDINGS AND FACILITIES: 6 Burner Units, 4 consisting of 42 Burner Houses each, 12′ x 160′ x 9′, 1 of 40 Burner Houses and 1 of 20 Burner Houses. Processing, storage and miscellaneous accessory buildings and equipment, 20 frame dwellings. Total all buildings, approximately 475,777 sq. ft.
DELIVERY STATUS: Currently this facility is being operated by Continental Carbon Company under an interim lease cancellable on 30 days' notice.
GAS SUPPLIES: Gas for the production of channel black is now being supplied by Shamrock Oil and Gas Corporation under a month-to-month contract with the present lessee.
The Texas Railroad Commission issues permits for burning natural gas in carbon black plants on an annual basis. A prospective purchaser or lessee for operation of all or part of the plancor at its present location should make his own arrangements to obtain necessary gas supplies.
SEALED BIDS:
Your sealed proposals on Standard Bid Forms will be received by War Assets Administration, Office of Real Property Disposal, P. O. Box 6030, Dallas 2, Texas, until 2:00 P.M., C.S.T., August 15, 1947, at which time all proposals will be publicly opened and read. Credit terms may be arranged. War Assets Administration reserves the right to reject any or all proposals. For a more detailed description of this property and for Standard Bid Forms write:
WAR ASSETS ADMINISTRATION
OFFICE OF REAL PROPERTY DISPOSAL
GOVERNMENT WAA SURPLUS
P. O. BOX 6030
DALLAS 2, TEXAS
1224-T

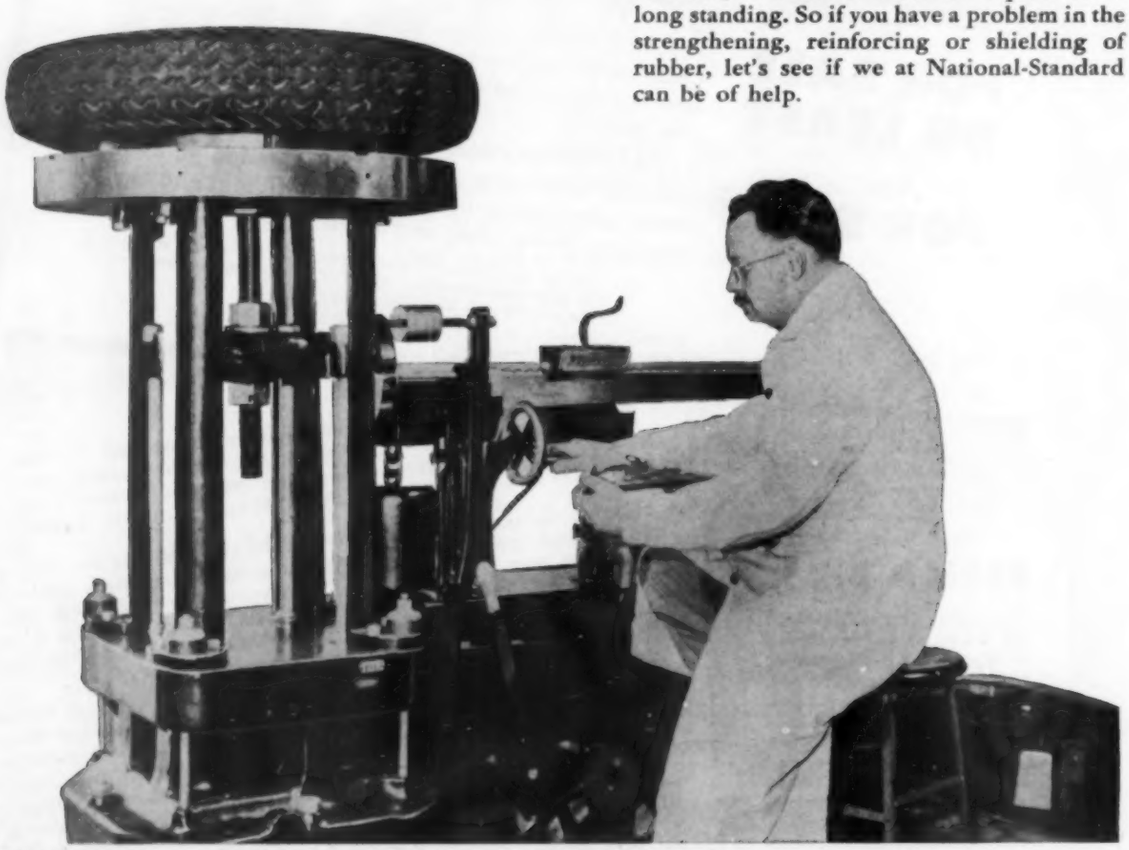
Failure that's good for business

TO remove the guesswork in tire building is good business . . . is good *for* business. And here is a machine that helps.

This special unit puts ever-increasing pressure on tire beads until they *fail,* permitting an exacting study of strength and elongation. It makes possible a comparison of constructions that may save you time and expense in long and delayed testing. It can also help you determine if materials are being used with maximum effectiveness.

Here at National-Standard, where we specialize in fabricated wires for tires and *all* wire-in-rubber products, this special tester is only one of our many types of special research and testing equipment. These extensive laboratory facilities, constantly at work, serve a two-fold purpose: to further the quality and usefulness of wire in rubber, and to help solve the problems of our friends and customers throughout the rubber industry.

As you may know, whole-hearted cooperation to the full extent of our broad experience, facilities and special skills, with no strings attached, is a National-Standard practice of long standing. So if you have a problem in the strengthening, reinforcing or shielding of rubber, let's see if we at National-Standard can be of help.



NS
NATIONAL-STANDARD
Division
NATIONAL-STANDARD COMPANY

DIVISIONS OF NATIONAL-STANDARD COMPANY

NATIONAL-STANDARD
Niles, Mich.
Tire Wire, Fabricated Braids and Tape

ATHENIA STEEL
Clifton, N. J.
Flat, High Carbon, Cold Rolled Spring Steel

WORCESTER WIRE WORKS
Worcester, Mass.
Round Steel Wire, Small Sizes

WAGNER LITHO MACHINERY
Jersey City, N. J.
Lithographing and Special Machinery

★ *A smooth, stable,* **DUSTLESS** *dispersion of* **ZINC STEARATE** *in water in concentrated form*

AQUAZINC

NO DUST . . . HEALTH INSURANCE FOR YOUR PERSONNEL

ATTENTION, manufacturers of milled stock, rubber compounds, molded goods, coated fabric and paper, Butyl rubber, latex and cements. Aquazinc is economical and efficient to use. It can be applied with uniformity and with no loss. It eliminates dust, inconvenience, fire hazard, and other difficulties accompanying the use of powdered Zinc Stearate.

AQUAZINC is particularly convenient for surface application of Zinc Stearate. When diluted with 8 to 20 parts of water, it can be applied by spray or bath.

THE BEACON COMPANY

PURITY · UNIFORMITY · DEPENDABILITY

Chemical Manufacturers

97 BICKFORD STREET · BOSTON, MASSACHUSETTS

In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST. W., MONTREAL

A NEW WHITE
and
BRIGHT ***Pigment...***

WHITETEX

- **Can be used in pastel colors of rubber, synthetic rubber and plastics, especially vinyls.**

ALSO... **as an extender for Titanium Pigments, Lithopone, Zinc Oxide.**

WHITETEX has a G. E. brightness of 90-92 and very good visual color.

• SAMPLES UPON REQUEST •

MOORE & MUNGER

33 RECTOR STREET NEW YORK 6, N. Y.

INDONEX

PLASTICIZERS

make milling easy

✔ Check the circulars you want and clip the list to your letterhead. Mail to:

STANDARD OIL COMPANY (INDIANA)

Chemical Products Department

910 South Michigan Avenue **Chicago 80, Illinois**

General results obtainable with INDONEX in natural and synthetic rubbers have been described in our Bulletin No. 13, while various other specific applications of INDONEX are discussed in the following Circulars:

☐ 13-1—Butyl Rubber Compounds ☐ 13-2—Butadiene-Acrylonitrile Copolymer Compounds ☐ 13-3—Neoprene Compounds

☐ 13-4—Tire Carcass Compounds ☐ 13-5—Footwear & Heel Compounds

☐ 13-6—Camel Back ☐ 13-7—Motor Mount & Bumper Compounds

☐ 13-8—Wire Jacket and other Extruded Compounds ☐ 13-9—GR-S Packing Compounds

☐ 13-10—Hose Compounds ☐ 13-11—Hard Rubber Compounds

INDOIL
CHEMICAL PRODUCTS

From Tires for Wheels

...to Rubber Heels

Dutch Boy: "Many different rubber products have one thing in common. They're better made with Red Lead."

Manufacturer: "But just what does Red Lead do?"

Dutch Boy: "It gives the seven advantages I've listed at right. Look them over."

Manufacturer: "But do I get all seven, no matter what I make?"

Dutch Boy: "With tires, all seven advantages are yours—but most of them apply with other products, too."

Manufacturer: "No matter what my base is?"

Dutch Boy: "Whether the base is GR-S, GR-S-10, GR-M, GR-A or GR-I. Just let us know your specific application and our technical staff will gladly supply literature and any other information you need. Drop a line to the Rubber Division of our Research Laboratories, 105 York St., Brooklyn 1, N. Y."

PLENTY OF Rx REASONS FOR COMPOUNDING RUBBER WITH #2 RM RED LEAD

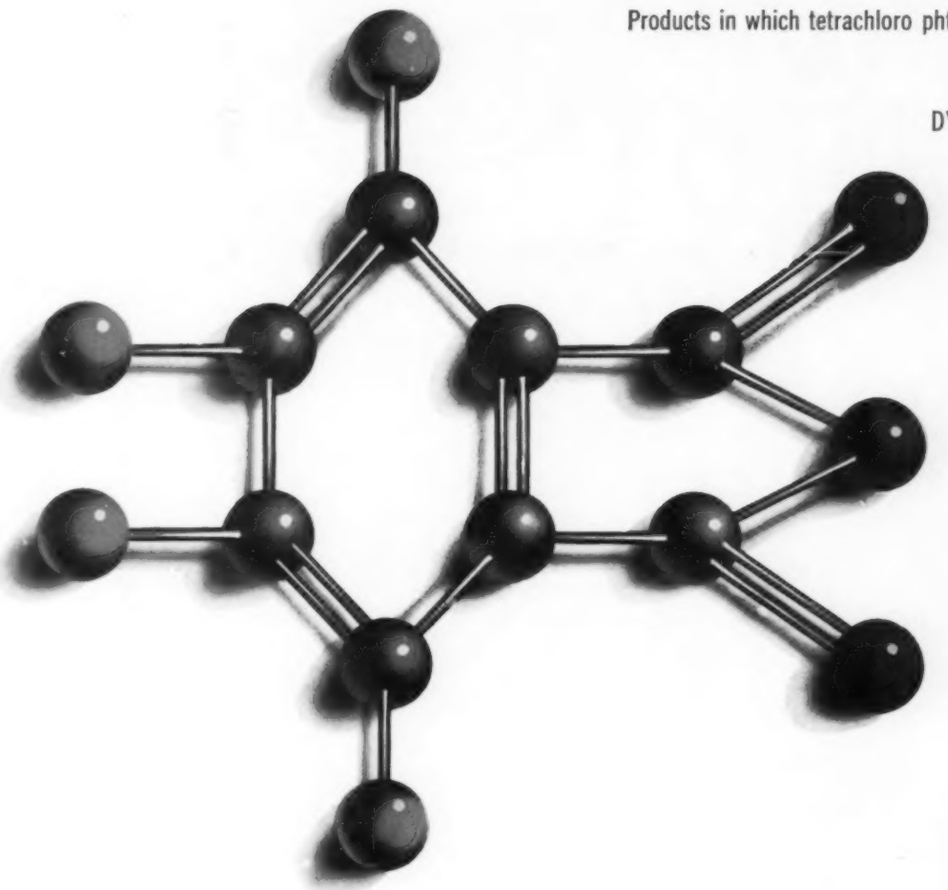
1. *Improved Heat Stability—Retention of Elasticity*
2. *Lower Heat Build-up—Cooler Running*
3. *Economical*
4. *Faster Curing Rate*
5. *Extended Curing Range*
6. *Excellent General Physical Properties*
7. *Safe Processing*

NATIONAL LEAD COMPANY—New York 6; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, West Virginia, (Evans Lead Division).

If it's made with Rx RUBBER RED LEAD ... it's better made with

NIAGATHAL W

Tetrachloro phthalic anhydride. Approx. 50% chlorine



Products in which tetrachloro phthalic anhydride has been used

DYES AND INTERMEDIATES

Types:

- anthraquinone
- benzoylbenzoic acid
- fluorescein
- indigo
- phenolphthalein

Esters for...

- Insulating materials
- Lubricants
- Pharmaceuticals
- Plasticizers
- Protective coatings
- Synthetic resins

NIAGATHAL A

Tetrachloro phthalic acid hydrate

- Reacts more readily with alcohols and bases
- Greater solubility in some organic solvents
- ★ Available in experimental quantities

Write for full details and samples

An Essential Part of America's Great Chemical Enterprise

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

Caustic Potash • Caustic Soda • Paradichlorobenzene • Carbonate of Potash
Liquid Chlorine • Niagathal (Tetrachloro phthalic anhydride)

NIAGARA ALKALI COMPANY
60 East 42nd Street
New York 17, N. Y.

Send to my attention, sample quantities of Niagathal W____, Niagathal A____. Send me Technical Bulletin on Niagathal____.

Name_____ Title_____

Company_____

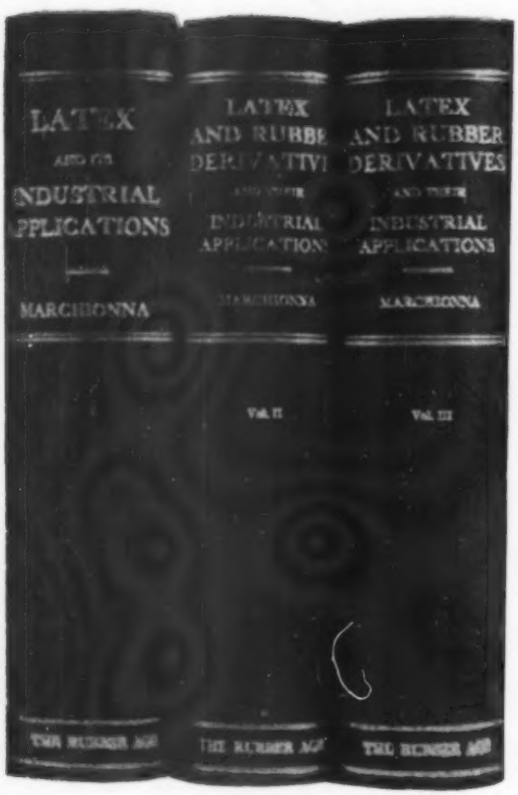
Address_____

New Low Price on

Vols. 2 & 3 of

"LATEX & RUBBER DERIVATIVES"

By Frederick Marchionna



Vol. II & III — 1670 Pages
6 x 9 in.—Completely Indexed

An Indispensable Book for Every User of Latex—

Order Your Copy Today!

TO clear out the remaining stock of this valuable bibliography on Latex and Rubber Derivatives and their Industrial Applications, we are now offering the two-volume set for a new low price of $10.00 (former price, $20.00).

This reduction gives every latex user an opportunity to have this important reference book at a price within the means of all. The two volumes contain abstracts of all patents on Latex issued from July, 1932 to January, 1937 in the United States, England, France and Germany, and abstracts of all patents on Derivatives from the earliest developments through January 1937, in addition to abstracts of every essential technical article published during these same periods throughout the world—a total of almost 4000 abstracts!

As an added feature of great value, each chapter is supplemented by a complete summary of the subject covered, written by the author or other leading authorities, including such recognized experts as John McGavack, Philip Schidrowitz, C. L. Beal, D. F. Twiss, G. A. Richter, M. O. Schur, A. Szegvari, Harry L. Fisher, L. B. Sebrell and E. J. Morris.

New Low Price:

$10.00 (Postpaid)

(Add 2% Sales Tax for copies mailed to N. Y. City)

•

Published by

RUBBER AGE

250 West 57th St., New York 19. N.Y.

Technical Bulletin No. 34 — on the Compounding of GR-S with Substantial Loadings of ZINC OXIDE

Blends of Natural Rubber and GR-S-10 with 100 Parts of Zinc Oxide

The following compounds were mixed separately on a 42" mill under the same conditions, as far as possible.

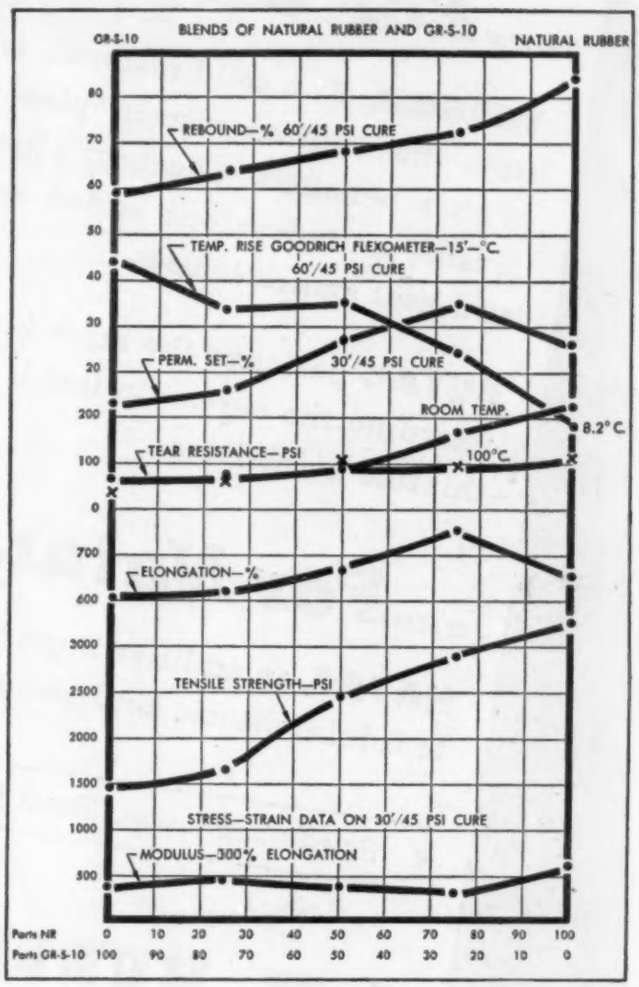
COMPOUNDS No. 34-34A

NATURAL RUBBER		GR-S-10	
Smoked Sheet	100.0	GR-S-10	100.0
Sulfur	3.0	Sulfur	3.0
MBT	1.0	MBT	2.0
"Agerite Powder"	1.0	DPG	0.1
Stearic Acid	3.0	Coumarone-indene Resin	3.0
ZINC OXIDE	100.0	E.L.C. Magnesia	5.0
		ZINC OXIDE	100.0

THE stocks were allowed to stand overnight, warmed-up on separate mills the following day to approximately the same plasticity, and sheeted-off thin. The required amounts for the varying proportions of Natural Rubber were plied up with the GR-S-10 and mixed thoroughly. The 100% Natural Rubber and GR-S-10 stocks were given similar milling treatment.

The stress-strain results, permanent set and tear resistance measurements are shown in the accompanying mixture chart together with rebound data and temperature rise on the Goodrich Flexometer.

The graphs show that the blends do not follow the mixture law very closely, indicating a two-phase system. However, each increment of Natural Rubber improves the tensile strength and tear resistance; rebound and heat generation are also improved. The modulus is generally lowered with increasing Natural Rubber and the elongation and permanent set are increased, indicating an effect on the curing characteristics of the blend. The cut-growth resistance is improved as follows:



	Cut-Growth—Tested at 70° C.—Inches Failure 6000 Cycles
100% GR-S-10	0.84
75% GR-S-10/ 25% NR	0.21
50% GR-S-10/ 50% NR	0.06
25% GR-S-10/ 75% NR	0.06
100% NR	0.09
Cure 60' / 45 psi	

These compounds show rather interesting aging characteristics which will be reported later.

HORSE HEAD PRODUCTS New Jersey zinc

THE NEW JERSEY ZINC COMPANY

160 FRONT STREET • NEW YORK 7, N. Y.

Products Distributed by THE NEW JERSEY ZINC SALES COMPANY

NEW YORK • CHICAGO • BOSTON • CLEVELAND • SAN FRANCISCO • LOS ANGELES

RESIN-ACID SOFTENERS

...For GR-S

TURGUM S, a solid material, is the improved type derived from the original viscous pine gum pioneered by HUBER. With a beneficial effect on pigment dispersion, it improves tensile, and develops added resistance to cut growth, tear, and heat embrittlement.

BUTAC performs the same functions as TURGUM S, without retarding the cure,—in fact it has a mild activating effect on thiazole accelerators.

...For Natural Rubber

NATAC, an additive ingredient for smoked-sheet compounds, to inhibit stearic acid and sulfur bloom of uncured stocks.

• Prices are lower. Send for quotations and further data. •

J. M. HUBER CORPORATION
342 Madison Avenue **New York 17, N. Y.**

HUBER

WYEX (EPC) • MODULEX (HMF) • SUPREX CLAY

The RUBBER AGE

VOLUME 61
NUMBER 4

One of the World's Outstanding Rubber Journals

M. E. LERNER
Editor

LEON KLEMPNER
Associate Editor

LOIS S. HOPKINS
Production Manager

DON DAVIS
Asst. Prod. Manager

HARRIET K. COLE
Circulation Manager

CHARLES T. JANSEN
Advertising Manager

PETER P. PINTO
General Manager

CONTENTS FOR JULY, 1947

Softeners for GR-S Tires. I. An Evaluation of Nine Softeners in GR-S Tire Treads—*By V. V. Wheeler, R. M. Vance, F. M. McMillan, and B. O. Blackburn* 437

Improving the Adhesion Property of Molded Sponge Rubber Parts—*By L. J. Wieschhaus* 443

Future of the Rubber Manufacturing Industry—*By A. Healey* 445

Bonding Rubber to Metal with Ty-Ply—*By Robert Shattuck* 451

Additional Data on the Goodrich Puncture-Sealing Tubeless Tire 454

●

REGULAR DEPARTMENTS

New Equipment	480	Coming Events	457
Book Reviews	488	Obituaries	476
Editorial	455	Los Angeles News	476
Financial News	472	Rubber, Cotton Markets	494
Names in the News	472	Current Statistics	496
Canadian News	478	Classified Ads	504

●

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

***New England Representative*—F. ROYAL CAREY, P.O. Box 133, Providence, R.I.**
***Western Representative*—IRVING V. KOCH, 64 East Lake St., Chicago 1, Ill.**
***News Correspondents*—WESTERN NEWS SERVICE, 316½ W. Pico Blvd., Los Angeles 15, Calif.; PHIL GLANZER, Tivoli Theatre Bldg., Toronto 1, Canada.**

Entered as Second Class Matter, October 20, 1933 at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.

Contents Copyrighted 1947 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

Also Publishers of:

RUBBER RED BOOK
Directory of the Rubber Industry
Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For Years 1938-1939

LATEX IN INDUSTRY (Out of Print)
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.

announcing BLE 25

the new low viscosity **BLE**

•FOR MANY YEARS BLE HAS SET THE STANDARD FOR ANTIOXIDANT VALUE IN THE RUBBER INDUSTRY.

Now, as the result of technical improvements in the manufacturing process, the viscosity has been reduced from:—

BLE — 250-500 poises

BLE-25 — 20-50 poises

RESULTS:—

•*Improved handling* — flows like water with a minimum of warming, easy to drain from drums, easy to add to mill or Banbury batches.

•*Protects* equally as well or better than regular BLE — based on very extensive laboratory and factory data.

Ask for bulletin on BLE-25

PROCESS—ACCELERATE—PROTECT with NAUGATUCK CHEMICALS

NAUGATUCK CHEMICAL

Division of United States Rubber Company

1230 AVENUE OF THE AMERICAS • NEW YORK 20, N. Y.

IN CANADA: Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ont.

VOL. 61
No. 4

RUBBER AGE

JULY,
1947

Softeners for GR-S Tires

I—An Evaluation of Nine Softeners in GR-S Tire Treads

By V. V. WHEELER*, R. M. VANCE*, F. M. McMILLAN†, and B. O. BLACKBURN†

LATE in the fall of 1944 it was considered advisable to evaluate some of the more common softeners used in compounding GR-S tires for their effect on tread wear resistance, by running a series of controlled road tests. Much laboratory data has been reported on softeners in tread-type stocks, the most outstanding being the report of Ludwig, Sarbach, Garvey and Juve *(1)*.

While a number of softeners have been tested in the treads of tires run on the government fleets and the results of these tests are fairly well known, very little is found in the literature on comparative road testing of softeners. Further, in most cases, the choice of softeners used in government fleet tests was either left to the discretion of the manufacturer or the number tested at any one time was limited, so that there is no extensive comparison of a representative group of commonly used softeners.

The purpose of this paper is to report the results of road wear tests on a series of nine softeners, together with the data from a series comprising increased black loading with increased softener. For convenience of presentation, the paper has been divided into two sections. This section will describe the methods of preparing and testing the tires, the procedure for evaluating the wear data, and the laboratory and road wear results on the selected softeners at a fixed loading. (EDITOR'S NOTE: The second section will appear in a subsequent issue).

Ludwig, Sarbach, Garvey and Juve *(1)* classified softeners based on chemical characteristics into sixteen different groups. Of these only those shown in Table I are commonly used as plasticizers in tire tread compounds.

Development of Formulae

Representative materials were chosen from each of the groups listed with the exception of the rosins. While the latter group possibly should have been included it was felt that two representatives of the pine products group would be sufficient. In one case a mixture of two groups was tested.

To more easily evaluate the effect of a group of softeners for tread wear, the incorporation in the test of a control containing a softener or group of softeners of known road performance is extremely helpful. For this purpose a softener mixture was chosen on which there was considerable manufacturing and road use experience.

The base recipe used for the passenger tire treads in this work is shown below. Table II lists the softeners used in the control stock and the experimental stocks and gives the accelerator adjustment made on each to reach comparable states of cure.

BASE STOCK FOR PASSENGER TREADS

GR-S	100.00
Zinc Oxide	3.00
Stearic Acid	1.00
Age Resistor	.80
EPC Black	45.00
Sulfur	1.75
N-Cyclohexyl-2-benzothiazolesulfenamide	varied
Softener	9.00

Except for the medium hard asphalt, the necessary adjustments for curing rate of the various softeners followed the usual pattern. The asphalt types of materials are usually relatively neutral in their effect on

TABLE I—SOFTENERS COMMONLY USED IN TIRE COMPOUNDING, CLASSIFIED ACCORDING TO LUDWIG, ET AL.

Class 11: Petroleum Products
- Group C Asphalts and related materials
- Group D Unsaturated petroleum derivatives

Class 12: Pine Products
- Group B Gum Turpentine
- Group C Rosins
- Group D Pine Tars

Class 14: Coal Tar Products
- Group A Tars

* General Tire & Rubber Co., Akron, Ohio.
† Shell Development Co., Emeryville, Calif.

TABLE II—PASSENGER TIRE TREADS—SOFTENER AND ACCELERATOR LOADINGS.

Class	Material Used	Accelerator Parts/100 GR-S
Control blend	Turgum S, Pine tar, Bardol	1.3
14 A. Coal tar	Bardol	1.1
12 A. Pine tar	Pine tar	1.6
12 B. Gum turpentine	Turgum S	1.8
11 C. Asphaltic flux	Paraflux	1.3
11 C. Soft asphalt	Asphalt No. 6	1.3
11 C. Med. hard asphalt	180-190° F. asphalt	1.6
11 C. Hard blown asphalt	Mineral rubber	1.3
11 D. Unsaturated petroleum softener	Dutrex 6	1.3
11 C, D. Blend, unsat. petrol. and asphalt	Dutrex 6 + 180°-190° F. asphalt	1.4

rate of cure and we have no explanation why this particular asphalt caused excessive retardation.

Another series of softener comparisons was made in truck tire treads, using the base stock shown below.

BASE STOCK FOR TRUCK TREADS

GR-S	100.0
Zinc Oxide	3.0
Age Resistor	0.8
HMF Black	52.0
Sulfur	1.7
N-Cyclohexyl-2-benzothiazolesulfenamide	varied
Softener	varied

The number of softeners tested in this case was not as great as in the passenger-tread series, but some variations in loading were tried. Two different proportions of softeners were tested, and in one case a compensating increase in carbon loading was evaluated. Table III shows these variables as well as the amount of accelerator used to give comparable states of cure.

Laboratory Evaluation

The tread stocks for both the passenger and truck tires were mixed in two passes through a No. 11 Banbury. In the first pass a masterbatch was made containing all of the compounding ingredients except the sulfur and accelerator. A sample of this masterbatch was taken to the laboratory and the proper accelerator adjustment was determined on an experimental trial size batch before the final mixing in the factory. In the second pass through the Banbury the accelerator was added. Sulfur was added to this final batch on the batch-out mill.

For the final laboratory evaluation, samples were taken of the factory-mixed stocks after they had been through the breakdown mill, feed mill, and tuber. This should insure that the samples were homogenous and representative of the properties of the final tire treads.

The laboratory testing was divided between the laboratories of the General Tire and the Shell Development Companies. The tests were for the most part complementary, although in some cases duplicate tests were performed and in others the same property was measured by different methods. Where test methods were the same, the results have been averaged for this presentation.

The physical properties of the passenger tread stocks are shown in Figure 1 in the form of differential bar graphs. The 60-minute cure at 145° C. (293° F.) was used for these comparisons. These will not be discussed in detail except to note what appear to be significant differences in the case of certain materials. For example, the asphalts appear to be characterized by relatively low tensile strength, low modulus and high elongation, in spite of the adjustment in acceleration to give a normal curing rate. The medium hard asphalt, which gave the lowest tensile, also gave the lowest tear strength of any of the softeners.

In laboratory abrasion tests, the asphalts, together with mineral rubber and the blend of asphalt and unsaturated petroleum softener, made relatively poor showings by one test method (angle abrader); the other method (New Jersey Zinc abrader), while also rating the asphalts as poor, indicated good abrasion resistance for mineral rubber.

The best abrasion resistance, by a small margin in both laboratory tests, was shown by the unsaturated petroleum softener. In view of the discrepancies between the two abrasion tests in several cases, it was of interest to determine whether either showed significant correlation with road wear. This question will be discussed below.

Pine tar and crude gum turpentine gave relatively good cut-growth and tear resistance but also showed poor resilience and high heat build-up, in keeping with the known behavior of this type of softener.

Preparation and Testing of Tires

The following considerations affected the final decisions on how the road test was to be conducted:

1. The tests were to be run in as many geographical

TABLE III—TRUCK TREADS—SOFTENER AND ACCELERATOR LOADINGS.

Class	Material Used	Softener, PHR	HMF black, PHR	Accelerator Parts/100 GR-S
(11 C.) Control	Mineral rubber	5	52	0.65
11 D. Unsaturated Petroleum	Dutrex 6	5	52	0.65
11 D. Unsaturated Petroleum	Dutrex 6	10	52	0.80
11 C, D. Blend, asphalt and unsaturated petroleum	Dutrex 6 + 180-190° F. asphalt	10	52	1.0
11 D. Unsaturated Petroleum	Dutrex 6	10	60	0.65

TABLE IV—GEOGRAPHICAL DISTRIBUTION OF TEST TIRES.

Location	Number of Tires Tested 6.00-16 Passenger	10.00-20 Truck
Atlanta, Georgia	12	4
Sewaren, New Jersey	12	8
Utica, New York	12	4
Sacramento, California	12	8
San Francisco, California	12	..
Waltham, Massachusetts	12	..
Indianapolis, Indiana	24	..
Rensselaer, New York	12	..
Brooklyn, New York	12	..
Fort Lauderdale, Florida	..	4
Total	120	28

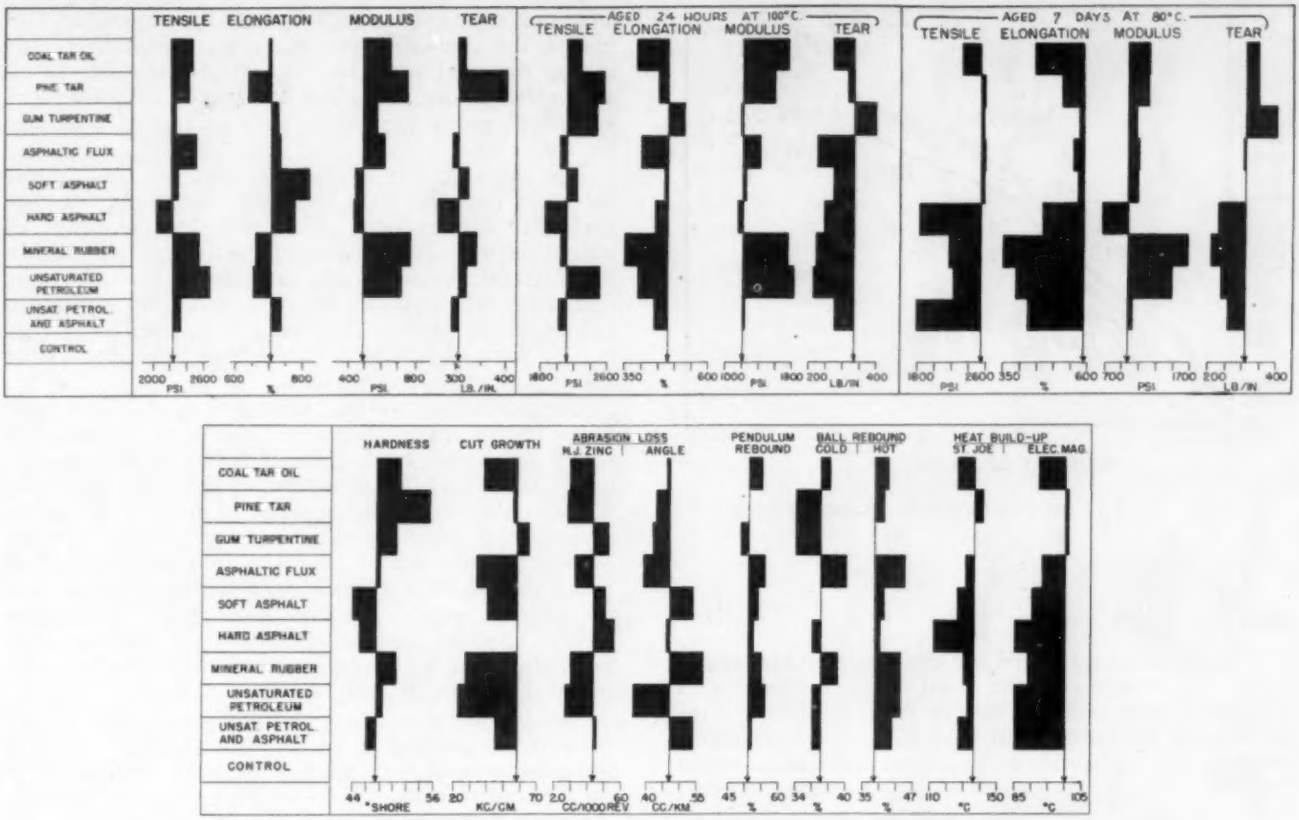


FIG. 1—Physical properties of factory-mixed passenger tire tread stocks.

areas as possible in order to obtain results under varying climatic conditions, types of road surface and driving habits.

2. Enough tires were to be tested on each stock that the results would be of some significance.

The only manner in which the above conditions could be fulfilled was by running tires built with half-and-half treads—one half being a control, the other half an experimental tread. The tires were constructed on the regular specifications for building production S-3 passenger tires and S-6 truck tires which were in use by the General Tire and Rubber Company at that time. No other changes were made either in compounding, building, or curing except those necessary to build a tire with an experimental and a control stock on the tread.

The road tests were conducted by the Operations Department of the Shell Oil Company. These tests were carried out on 30 passenger cars and 7 trucks, distributed among 10 different communities in 7 states. A total of 148 tires were tested, and these ran up an aggregate mileage of over 2½ million miles. The geographical distribution of the test tires is shown in Table IV.

The choice of the particular locations shown in Table IV was dictated to some extent by the availability of cars, but was mainly determined by the purpose of running the tires under all types of weather and road conditions.

The twelve 6.00-16 tires in each set represent twelve different experimental tread stocks. At least one tire from each stock was sent to every locality. Ten tires were built from each experimental stock to give a total of 120 passenger tires. This section of the paper covers nine of the experimental stocks and is a report on ninety of these tires.

The truck tires were tested in five localities and the same procedure was followed as for the passenger tires, i.e., use of half-and-half treads with one half as a control. Seven tires each of the four constructions were built and tested.

The following procedures were set up for road test conditions and for reporting the road wear results:

The passenger tires, all of which were 6.00-16 size, were mounted four to a car. They were rotated every 2,500 miles through all wheel positions, and at the time of rotation the tread-groove depth of each of the two sections was measured in five places with a Starrett depth gauge, the end of which had been rounded off. At the time of rotation and measurement, a report was filled out recording the mileage, the tread depth, approximate type and amount of driving covered and the approximate temperature range in the interval between reports. Air pressure was checked daily and held at twenty-eight pounds.

The truck tires were treated essentially the same. One tire of each construction was mounted on the drive wheels only of a dual-wheel tractor hauling a trailer loaded with gasoline. These tires were rotated every 5,000 miles through all drive wheel positions. Tire measurements were taken in the same manner as for passenger tires at the time of rotation. The truck tires, which were 10.00-20, 12 ply highway type, were kept at 70 pounds air pressure.

While the control of test conditions was necessarily poorer than that which can be realized in a regular test fleet, the adherence to the above schedule was reasonably good.

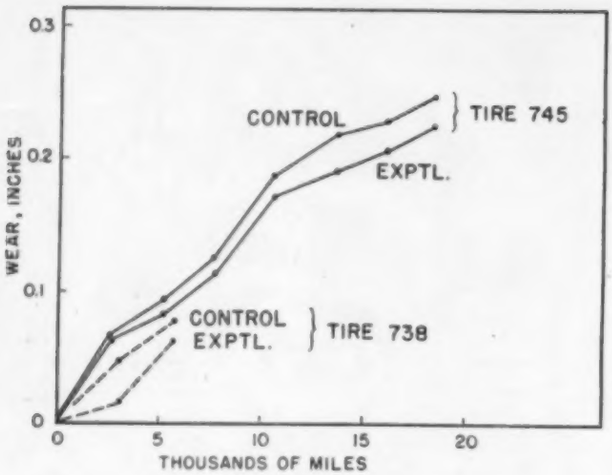


FIG. 2—Typical wear curves—passenger tires.

Road Test Results

The choice of a method for summarizing and evaluating the results of the road wear measurements presented some problems arising from the fact that the testing and measuring were performed by a large group with an extremely wide geographical distribution rather than by a few individuals in a single location.

Considering the important place of road wear measurements in rubber testing and its universal use by both government and private industry as the ultimate arbiter in all questions regarding tire compounding, it is surprising that there are so few adequate descriptions of road test methods or results in the recent literature. The most detailed current report is that of Moyer and Tesdall *(2)* of the Iowa Engineering Experiment Station, who studied tire wear as a function of roadway surface and driving conditions. These authors investigated both tire weight and tread-groove depth as criteria of tread wear and concluded that the latter gave the more consistent results. On the other hand, Roth and Holt *(3)*, in describing road tests conducted by the Bureau of Standards, advocate following the wear by weight loss rather than by tread-depth measurements. However, this method is of course inapplicable when half-and-half treads are used.

The government test fleet operating during the war in Texas usually rated each set of tires tested on the basis of relative tread depth at any convenient single mileage *(4)*. While satisfactory for a fleet test of small groups of tires, this method was inappropriate in the present case, where a large group of tires was to be intercompared and where wide differences in operating conditions resulted in service mileages ranging from a few thousand to over 30,000 miles.

Two different methods were finally employed in analyzing the results of the present series of tests, which may best be illustrated by reference to a typical wear curve for two of the test tires, shown in Figure 2. In this figure the periodic tread depth readings are plotted against mileage for the experimental and control halves of the tires. As a first approach, a simple comparison was made between the amounts of tread worn off of the two halves of each tire at the time it was removed. Rather than taking the ratio between these two readings for each tire and then averaging the results, the alternative procedure was adopted of adding up the total wear for the experimental halves of all ten tires in one group and dividing by the total mileage of the group to give the average rate of wear for the entire set.

The ratio of this average to that for the control halves of the same tires then gave the rating for that particular construction. This was done in order to weight the averages in favor of the tires which had run the farthest, since it was considered that the few measurements available on tires suffering premature failure due to abuse or accidents (e.g., tire 738 in Figure 2) were of less significance than those from tires which had given full service.

The general method just described is of course open to the objection that the entire evaluation is based on a single, final depth reading for each tire. With measurements being made by a number of different observers, it was considered highly desirable to utilize a method of evaluation in which all of the wear measurements made during the test would be taken into account but in which the readings taken at high mileages would have the greatest weight. It was also desirable to have a method to which objective criteria of significance could be applied and the probable errors in the results estimated by statistical analysis.

The procedure adopted to fulfill these requirements consisted in plotting all of the wear readings taken on the experimental stock against the wear readings taken on the control stock for all ten tires on a single graph. Since on the average, some five or six readings were taken during the life of each tire, this gave a plot containing upwards of 60 points, and the curve expressing the average relative wear could be located by the method of least squares. Figure 3 shows typical curves constructed in this way for two of the nine different compounds tested.*

This method of locating the curve favors the points farthest from the origin, which fulfills the desired conditions. By inspection of these curves one can gain a qualitative idea of the consistency of the results, and the fact that the locus is well represented by a straight line over the entire range justifies acceptance of the

* The authors are indebted to E. M. Brunner for suggesting this procedure.

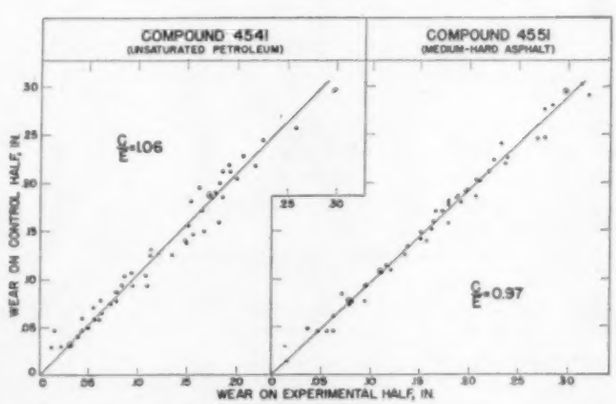


FIG. 3—Relative wear of experimental and control tread sections of two groups of test tires, based on individual readings for all tires in group.

slope of that line as a measure of the relative rate of wear of the experimental stock with respect to the control. Multiplication of this slope (C/E) by 100 gives a direct road wear rating in per cent of the control, the best-wearing compound giving the highest rating. Thus the two compounds in Figure 3 are rated at 106% and 97% of the control, respectively.

The probable errors in the location of these curves were calculated (probable error = two thirds the standard deviation) and values of the order of ± 1% were obtained for the probable errors in the road wear ratings. This of course refers only to the accuracy of locating the curve from the data at hand, and means, not that the actual error cannot exceed 1%, but that it is as likely to be smaller than 1% as it is to be greater.

The combined results for all nine softeners are shown in Figure 4, which includes the ratings based on final tread depth measurements as well as those derived from the control vs. experimental graphs of Figure 3.

From these data it may be seen that the best softener gave road wear approximately 108% of that of the control, and the poorest about 97%. While these differences are not large, it does appear that some types of softeners give measurably better road wear than others; and these results provide some indication as to which classes of softeners are likely to give the best performance in this particular type of recipe. The coal tar oil and unsaturated petroleum softener showed the best road wear performance in this series, while the medium hard asphalt was the poorest.

It must of course be recognized that, as in all rubber testing, the results obtained here would not necessarily be duplicated with other types of recipes. However, it is of interest in this connection to compare the results obtained in the truck tread series, which were run with an HMF black rather than an EPC black stock, but which included a smaller number of softeners.

The physical properties of the five stocks tested in the truck tread series are shown in Figure 5. The differences in tensile properties, both before and after aging, are small, with the exception of the mixture of asphalt and unsaturated petroleum softener, which again showed low tensile, low modulus, and high elongation. All five compounds gave similar rebound values, but in the hysteresis tests the stocks containing 10 parts of softener showed appreciably lower heat build-up than those containing 5 parts. These compounds also exhibited considerably better cut-growth resistance than the others.

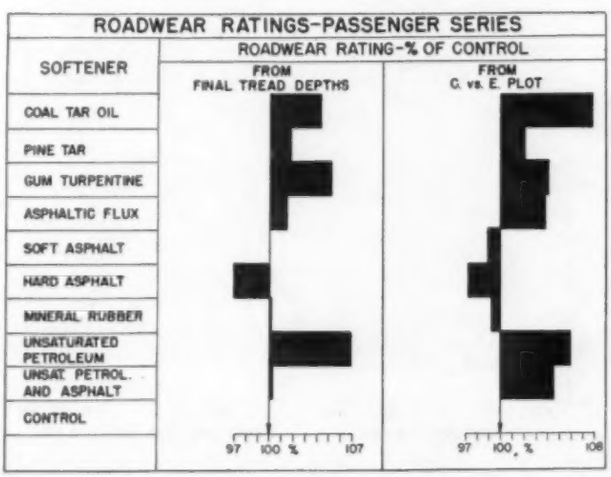


FIG. 4—Road wear ratings of passenger tire treads.

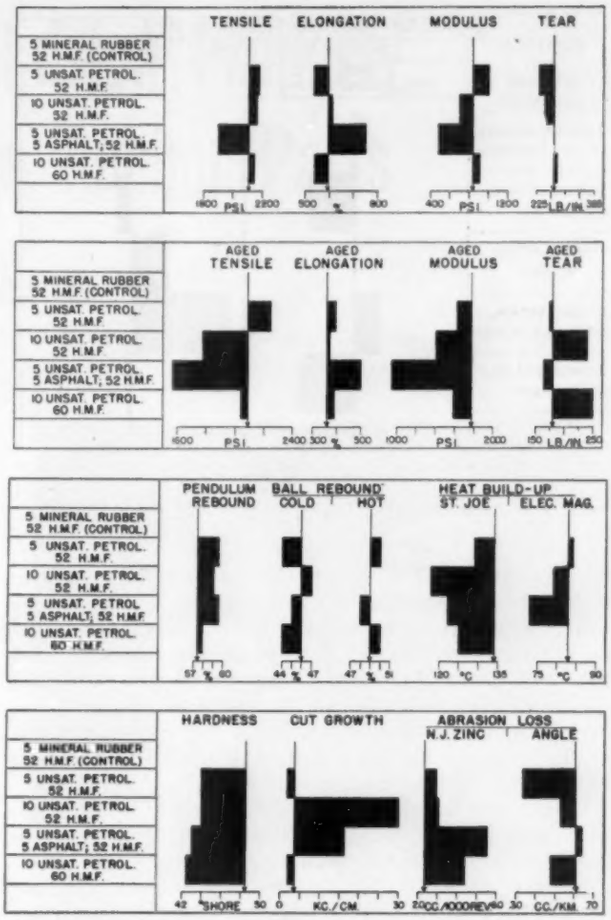


FIG. 5—Physical properties of factory-mixed truck tire tread stocks.

The abrasion tests are in at least rough agreement in this series, and again the mixture containing the medium hard asphalt showed the poorest abrasion resistance.

The relative road wear of the four experimental truck treads in comparison with the mineral rubber control, as determined by the two methods described above, are shown in Figure 6. It should be mentioned that, due to the smaller number of tires of each construction tested (7 instead of 10), and the less frequent measurements (readings at 5000-mile instead of 2500-mile intervals), fewer data were available for determining the relative road wear in the truck tire series than in the passenger tire series, and the accuracy of the ratings is therefore somewhat lower.

It is evident from Figure 6 that the unsaturated petroleum softener gave better road wear than the mineral rubber control when both were tested at a loading of 5 parts per hundred of GR-S. Increasing the amount of unsaturated petroleum softener resulted in poorer road wear, and a still greater decline occurred when part of the unsaturated petroleum softener was replaced by asphalt. The special case in which a high softener loading was combined with a high carbon loading will be discussed later.

At this point it is of interest to ask the question whether the order of merit of the various tire treads

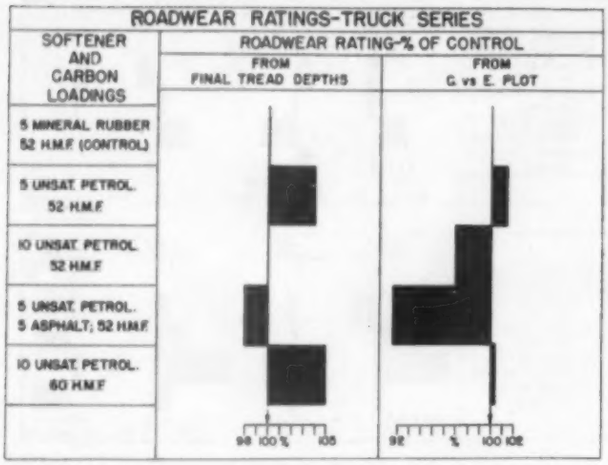

ROADWEAR RATINGS-TRUCK SERIES
SOFTENER AND CARBON LOADINGS
ROADWEAR RATING-% OF CONTROL
FROM FINAL TREAD DEPTHS
FROM G vs E. PLOT
5 MINERAL RUBBER 52 H.M.F (CONTROL)
5 UNSAT. PETROL. 52 H.M.F.
10 UNSAT. PETROL. 52 H.M.F.
5 UNSAT. PETROL. 5 ASPHALT; 52 H.M.F.
10 UNSAT. PETROL. 60 H.M.F.
98 100 % 105
92 % 100 102

FIG. 6—Road wear ratings of truck tire treads.

could be predicted with any degree of accuracy from the laboratory tests conducted on the stocks in advance of the actual road tests. Of course it may be said immediately that the laboratory evaluation established that all of the products tested gave properties that could be considered acceptable for tire tread compounds, and that from the general similarity of the laboratory test results it could be predicted that the differences in road wear would be relatively small.

This somewhat negative forecast was of course fulfilled, and it may perhaps be expecting too much to hope that a correlation could be found within the relatively narrow range of road wear percentages observed here. However, it will be recalled that the laboratory tests indicated that the medium hard asphalt gave the poorest over-all properties (particularly tensile strength, tear resistance, and abrasion resistance); and this material proved to give the worst road performance of the nine softener combinations tested.

On the other hand, it was not possible to single out any one product as showing definite superiority in over-all physical properties; and it therefore cannot be said that the compounds that gave the best road wear exhibited exceptionally good physical properties in the laboratory tests.

The possibility of correlating road wear with laboratory abrasion tests was of particular interest, and the data for both the passenger and truck series have been plotted in Figures 7 and 8 to show the degree of correlation obtained with the two different laboratory abrasion tests used in this study. The road wear rating used here is the average of the two ratings shown above.

From Figure 7, which shows the data for the passenger tire series, it may be seen that the correlation is rather poor for both the angle abrader and the New Jersey Zinc abrader. The best and worst materials fall in the proper quadrants but there is a great deal of scattering in the intermediate values. The correlation coefficients calculated by regular statistical methods are —0.55 and —0.53, respectively, for the two methods (since a high road wear rating corresponds to a low abrasion loss, the correlation coefficient has a negative sign). These values are barely sufficient to indicate any real correlation. When the number of observations involved is taken into consideration, it may be estimated that there is slightly better than one chance in twenty that the apparent correlation is accidental.

Similar data for the truck series are shown in Figure 8, and here it appears that the correlation is somewhat better, particularly in the case of the angle abrader, although of limited significance in view of the small number of observations. The correlation coefficients in this case are —0.82 and —0.62, respectively, and the chances that the correlations are accidental are appreciably less than one in twenty.

Considering the narrow range of values covered in these particular sets of data and the questionable reputation of laboratory abrasion tests in general, the modest degrees of correlation obtained in this work are perhaps all that could reasonably be expected.

LITERATURE REFERENCES

(1) Ludwig, Sarbach, Garvey and Juve, *I.R.W.*, Vol. 111, pp. 55, 173 (1944); Vol. 112, p. 731 (1945).
(2) Moyer and Tesdall, Iowa Engineering Experiment Station Bulletin 161, *Iowa State Bulletin*, Aug. 1, 1945.
(3) *Journal of Research, National Bureau of Standards*, Vol. 32, p. 61 (1944).
(4) Bibliography of Scientific and Industrial Reports, U. S. Department of Commerce, O.T.S., Vol. 3, No. 8, Nov. 22, 1946.

NOTE: This paper was presented before the Division of Rubber Chemistry of the American Chemical Society at the meeting held in Cleveland, Ohio, May 26-28, 1947.

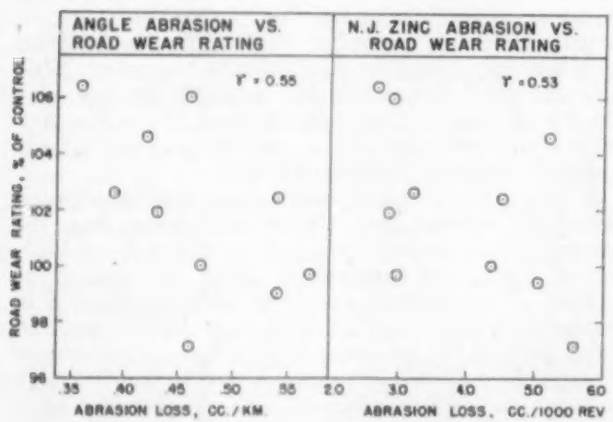

ANGLE ABRASION VS. ROAD WEAR RATING
N.J. ZINC ABRASION VS. ROAD WEAR RATING
r = 0.55
r = 0.53
ROAD WEAR RATING, % OF CONTROL
ABRASION LOSS, CC./KM.
ABRASION LOSS, CC./1000 REV

FIG. 7—Correlation of laboratory abrasion tests with road wear of passenger tires.

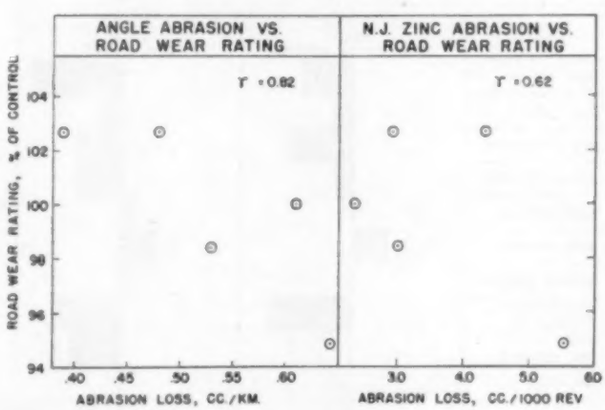

ANGLE ABRASION VS. ROAD WEAR RATING
N.J. ZINC ABRASION VS. ROAD WEAR RATING
r = 0.82
r = 0.62
ROAD WEAR RATING, % OF CONTROL
ABRASION LOSS, CC./KM.
ABRASION LOSS, CC./1000 REV

FIG. 8—Correlation of laboratory abrasion tests with road wear of truck tires.

Improving the Adhesion Property of Molded Sponge Rubber Parts

By L. J. WIESCHHAUS

Market Research Engineer, American Wheelabrator & Equipment Corp., Mishawaka, Indiana

IN the production of molded sponge rubber products, just as in the baking of bread, precaution must be taken to prevent the product from sticking to the mold. There are many ways of accomplishing this result and each has its own advantages and disadvantages. One of these methods is to dust the uncured stock with finely ground mica or talc while it is being prepared for the cure. The mica forms a layer which keeps the sponge compound from sticking to the mold and permits the passage of air between the sponge and the mold.

It is extremely important that this air passage be retained otherwise air is trapped in a section of the mold and prevents the rubber from filling the mold completely at that point. Since chemically blown sponge does not exert pressures sufficiently large to force air out of the way of the blowing stock, some mechanical means of eliminating the air must be used. The finely ground mica serves this purpose and enables the air to find its way out of the molds through natural vents provided for this purpose. Mica's one disadvantage is the difficulty encountered in removing it from the surface of a piece after curing.

The Brown Rubber Co., of Lafayette, Indiana, one of the pioneers in the production of chemically blown sponge rubber parts, has been using mica for many years and has successfully solved the problem of its removal after curing. Their products include weather stripping, door seals, trunk lid seals and channels for motor cars and trucks; sponge rubber seat cushions and arm rests; and molded sponge rubber gaskets for radios and refrigerators. Since most of these parts must later be cemented into place, it is important to remove as much of the mica as possible or at least to improve its adhesive properties.

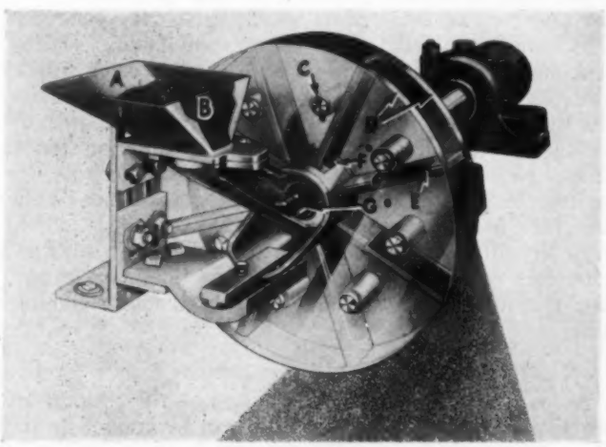


FIG. 1—Mechanism for propelling abrasive. (A) abrasive funnel; (B) abrasive; (C) spacers between side plates; (D) special steel side plates; (E) cast alloy blades, removable; (F) cast alloy control cage; (G) cast alloy impeller.

FIG. 2—A load of molded sponge rubber strips being discharged from the 27 x 36 inch Wheelabrator Tumblast at the Brown Rubber plant.

The company's previous method of doing this was to dry tumble the pieces after leaving the mold to remove most of the mica adhering to the surface. The pieces were then dipped in a dye which served the double purpose of giving the parts a uniform color and of presenting a better bonding surface for the subsequent cementing operation. The dyeing, of course, did not completely remove the mica but it did serve to neutralize its bad effect on the bonding operation.

Recently, Brown Rubber became interested in the possibility of using grit blasting as a means of removing this mica and preparing the strip for cementing.

Airless abrasive blasting, or Wheelabrating as it is usually called, has been used for many years in the metal working industry and is the most generally accepted and successful method of cleaning castings, but this was something quite different and it was only after several tests were run to determine the effectiveness of the method, that it was decided to purchase a 27 x 36 inch Wheelabrator Tumblast for this use. The machine has been in operation several months now and has performed with complete satisfaction.

The mica is removed as a result of the scouring action of a blast of steel grit hurled at the parts as they are being tumbled in the machine. Figure 1 illustrates the mechanism used for propelling the abrasive upon the work. Abrasive from an overhead storage hopper (A) is fed to the center of the wheel, whereupon it is hurled, under perfect control, upon the work to be blasted. The wheel, rotating at high speed, throws the abrasive by centrifugal force.

A cast alloy impeller (G) rotates with the wheel proper and carries the abrasive to an opening in the stationary control cage (F) where it discharges to the bladed section of the wheel. At this point the abrasive is picked up by the inner ends of the throwing blade (E) and is gradually accelerated in its passage to the periphery of the wheel. The final throwing velocity is the result of radial and tangential forces and efficiently utilizes all of the power supplied to the unit.

In this particular application, cleaning time varies from one to five minutes per load depending upon the size and shape of the pieces and the density with which they pack in the conveyor of the machine. The 27 x 36 inch Tumblast in use at this plant (Figure 2) has a five cubic foot operating load capacity and is operated about 15 hours per day. This handles all of the small molded pieces which are being produced. A larger machine has been designed to handle long automobile trunk seals with a maximum length of 170 inches. The tumbling room at the Brown Rubber plant before installation of the Wheelabrator is shown in Figure 3.

The process not only removes all of the mica from the rubber strips but provides the added dividend of making the part numbers more legible and of slightly roughening the surface of the rubber, thereby providing a far superior bonding surface than that provided by the normal smooth surface left by the mold. By eliminating the necessity of dyeing and drying the strips, it has improved the working conditions considerably as is readily apparent from a comparison of Figures 2 and 3. Figure 4 shows a number of molded sponge rubber parts before and after Wheelabrating.

FIG. 3—View of the tumbling room at the Brown Rubber plant before installation of the Wheelabrator. The dyeing vat is seen on the left.

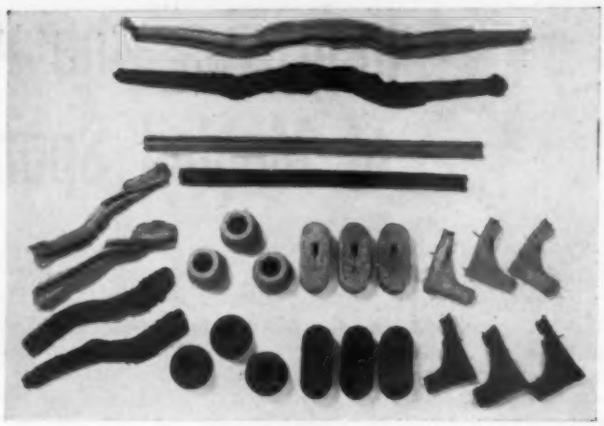


FIG. 4—Molded sponge rubber parts before and after Wheelabrating. The light colored parts are still covered with mica.

The process of Wheelabrating has been receiving considerable attention in recent years by the rubber industry for a wide variety of applications ranging from the roughening of a surface to improve its adhesive properties to the other extreme of cleaning tire molds to eliminate the possibility of the tire adhering to the mold. Many interesting and useful applications have resulted from these tests and a complete testing laboratory is being devoted to the testing of each new application that arises.

Castaloy Vacu-Therm Generator

The Castaloy Vacu-Therm Generator, recently introduced by the Castaloy Corporation, 197 South Waterman, Detroit 17, Mich., is described as a new, inexpensive heating unit which gives promise of answering practically all of the present plastic heating problems. It is said to be capable of delivering quick, controlled heat to 550° F., plus or minus 5° F. under low operating temperatures. The generator is a heavily insulated, self-contained unit with no moving parts. It has no motors, pumps or gaskets. All controls are easily accessible in a panel enclosure on one end of the unit. The heat transfer medium is Dowtherm E, sealed in a heavily welded vacuum chamber. This liquid vaporizes when it reaches its efficient operating range, and transfers heat to the operation through flexible tubes or pipes.

A packaged continuous-balance control system of practically infinite sensitivity that can be applied to the automatic control or regulation of various equipment is offered in the **Motron Servo Model 61 A,** a product of the W. C. Robinette Co., South Pasadena, Calif. Among other applications, the system can be used for tensioning, guiding and winding thread, wire, paper, cloth, etc.

Future of the Rubber Manufacturing Industry

By A. HEALEY, B.Sc., F.I.R.I.

Director of Production, Dunlop Rubber Co., Ltd., London, England

Early in 1946 the Institution of the Rubber Industry announced the inauguration of Foundation Lectures, to be given by outstanding and eminent experts on any and all subjects within the sphere of rubber. One major purpose of the lectures is to foster international good will and understanding. The article published herewith is the First Foundation Lecture and was delivered by the author in Birmingham, England, on May 10, 1946. It is reproduced from the December, 1946, issue of "I.R.I. Transactions." The article contains some broad conclusions and observations, plus some provocative suggestions of interest and importance to rubber manufacturers in all parts of the world.—Editor.

WHEN the Institution did me the honor of asking me to deliver its first Foundation Lecture, it was suggested to me that as the lecture was to be delivered in the Midlands, and as I had devoted a great deal of time in the past to the technical side of tire production. I should deal at some length with tires and the scientific problems associated with them. This I shall endeavor to do.

For various reasons it is deemed best to expand the subject. In the first place, there are many experts in the Midlands who are much better qualified to deal with the purely technical aspects of tire production and design, and in the second place, as this is the first of a series of lectures which the Institution hopes to provide, it would not be fitting to deal exclusively with tires. Further, at this time, the whole rubber industry is faced with exceptional and special problems which cannot be omitted from a lecture of this character.

The title of the lecture was chosen to allow as wide a scope as possible, and it will be appreciated that, the Institution being primarily concerned with the technical and educational sides of the industry, I have avoided consideration of many economic and financial problems and have presumed all through that general conditions throughout the world will permit that kind of future for the rubber industry that it should have, based upon its capacity to supply the needs of the people, and to improve their standards of living.

By request, I have avoided too much reference to the past, but on occasion it is necessary to consider the past in order properly to evaluate the present and to formulate future prospects. Rather than give statistics, which must be familiar to you, I have chosen to present certain broad conclusions and observations, with here and there admittedly somewhat provocative suggestions.

Present Size of the Rubber Industry

At the outbreak of war in 1939, the rubber industry in this country (England) directly employed roughly 80,000 people of various classes. No exact figures are obtainable, on account of the lack of a precise definition of the industry. In the U.S.A., the rubber industry at that time was probably employing about 300,000 people. These figures are not in themselves impressive in comparison with other industries such as mining, agriculture, textiles, iron and steel, and must be understood in relation to the heavy employment in those industries, such as the engineering, textile and chemical industries, which supply materials and machinery and power to the rubber manufacturer.

The money value of the output is a better measure of the total employment, direct and indirect. In 1939, although again no actual statistics are available, it can be estimated approximately that the U.K. rubber industry produced goods to the value of well over £60,000,000 (approximately $240,000,000). Each employee in the industry was therefore producing roughly £750 (approximately $3,000) worth of goods per annum, and in doing so, made employment somewhere in the world for four or five others.

Development of the Industry

From a long view of the history of the industrial age, it is obvious that our industry was a very late starter, owing to the lateness of scientific study applied to the industry and to the rarity of its principal commodity. Although rubber has been known to commerce for over two hundred years, it found little favor on account of the noxious odor it usually had and of its tendency to become sticky and shapeless. As with so many promising developments, early and quite valid objections reinforced popular prejudices and delayed progress.

Even when rubber products were definitely established and in great demand, the delay, partly unavoidable in the course of nature, in providing the essential raw materials, resulted in so heavy a price as to hold back many developments. The 1914-18 war, while it delayed commercial developments, yet inspired many new technical ones and placed the rubber industry in a position of "essentiality" to the life of a nation. It was from that time on, established as a necessary part of the industrial chain, and in between the world wars, the industry continued to expand and develop, while many other industries were suffering from the ills of world depression.

We need waste no time in imagining what would have happened to the industry if the years of industrial and economic depression between 1920 and 1934 had not come, but we can at least find ground for believing that the future, given stable economic conditions, is full of possibilities, which will be considered later.

Many articles described generally as of rubber depend for their foundation on textile materials. Tires, belting, hose, footwear, waterproof cloth, are notable examples. It is natural, therefore, that the industry should be deeply concerned with developments in textile fabrics. Most of the articles enumerated demand specialized types of fabric, the correct design and quality of which play a great part in the efficiency and

cost of the ultimate product. Cotton fabric has, up to now, been by far the most commonly employed. During the war the use of rayon in tires greatly increased because it resulted in a reduction of the high temperature generated in synthetic rubber tires subject to heavy loads or high speeds.

One of the original disadvantages of rayon, a disadvantage which prevented its use in the early days of the 1920's, was its tendering under the influence of moisture. In these days of improved rayon and of good roads, and tough thick treads on tires, the likelihood of water entering into the fabric part of the tire and causing damage is remote.

It is now quite clear that rayon will continue to be used in tires, the proportion of cotton and rayon depending on several factors including the kind of tire and the kind of use to which it will be put and the relative costs of rayon and cotton fabrics. Important developments, both in the character of the fibre and in the methods of twisting, folding and doubling of the fibres, are to be expected and will undoubtedly result in more efficient products.

Perhaps the next most important secondary material for the rubber industry is carbon black, which came into fairly general use about 30 years ago. It has wonderful properties but, unfortunately, in imparting great toughness and durability to rubber compounds, it reduces elasticity and therefore increases the amount of heat generated in tires, so much so that in extreme cases of load and speed, tires have to be made with little gas carbon black, or with none at all, even at the expense of durability. In less extreme cases, the heat generated limits the thickness of tread which can be incorporated in a tire.

Many efforts are continually being made to find a material which will have all the advantages of gas carbon black and none of its disadvantages, but it begins to appear that the mechanical or chemical interaction of a powder with rubber which develops great toughness must inevitably reduce elasticity and the quest for a universal ingredient may be rather like the quest for perpetual motion. I am led to make this remark because the subject has been treated so fully by eminent technicians that a solution of the problem at this date seems unlikely.

I will not endeavor to treat technically all the other well-known ingredients, many of them important and imparting quite special properties to rubber compounds. I would, however, like to suggest that there is great scope for bringing rubber compounding under the influence of the new molecular physics and chemistry. The empirical approach has served a good purpose, but we are practically at the end of this road. Side by side with the molecular aspect of compounding, some attempt ought to be made to define and to measure accurately such properties as plastic flow, internal friction, rigidity, under dynamic as well as static conditions. A great deal of work has been done, and we are now on the threshold of great discoveries.

This seems to be the right place to make a digression on some technical possibilities. Rubber factories handle a material which is to some extent thermoplastic, to some extent thermosetting, and the rubber manufacturer very often finds himself sailing between Scylla and Charybdis. More precise knowledge of the properties of unvulcanized compounds, accompanied by a more exact instrumentation, will lead, no doubt, to much more efficient working and to better products.

Rubber factories usually contain very heavy machinery, costly to replace or even to modify. This fact has exercised a great retarding effect on compounding technique, the tendency being always to provide materials which a workman can turn into products with the machinery already at his disposal. The rubber industry throughout the world is in this position. Over the next few years one may hope that the emphasis will be shifted in the direction of adapting rubber machinery so that it will produce the goods from materials known to be the best. If there is any blame here—and it is certainly not my intention to apportion blame—the technicians must bear their part of it. It is their business to make their knowledge more precise and convincing.

Principal Products of the Industry

The future of the industry must naturally be considered in relation to its present-day products, and with coming developments of new or old products. We will, therefore, examine certain rubber products, very important from the point of view of large volume; examine their degree of indispensability, their probable line of development, and their future expansion or decline.

Tires: For many decades tires have consumed more crude rubber per annum than all other products together. In 1939, however, the percentage of rubber used in tires was beginning to decline, by reason of the more rapid expansion of the range and volume of other products. During the war, tires consumed in the U.K. about 65 per cent of the total crude rubber. It is natural that the future of the rubber industry is largely determined by the tire industry and no apology is required for giving so much space to it.

At first glance (if after all these years we can recapture our first glance), the pneumatic tire seems to be a simple device, a kind of freak, and one might have expected it to have led not merely to a more complicated and refined edition of itself, but to have paved the way to a really basic design of tire, bearing little resemblance, if any, to its prototype.

Essentially, the pneumatic tire is the same today as it was in 1888. There has been no development of a fundamental kind. This is all the more remarkable when we contemplate the staggering number of patents dealing with alternatives, some based on the suppression of the pneumatic principle, some on the transfer of the necessary resilience from the tire to the wheel itself. How many enthusiasts have persuaded themselves that the pneumatic tire, heir to so many troubles in service, relatively expensive, and having a limited life, will be superseded by their new and revolutionary ideas? It is important to remember this when looking toward the future. That what has prevailed in the past will always prevail is a stupid theory, yet there is a certain strength in the assumption that at least all the alternatives so far suggested have failed.

When the Malay Peninsula and the Dutch East Indies were lost to us in early 1942 and our precious stocks of rubber had to be conserved, there was a recrudescence of interest in spring wheels, leather treads, bitumastic or other substitutes for treads of tires, and the history of fifty years was as if it never had been. For who of us, contemplating another industry, has the courage to say that our own bright ideas concerning it are probably valueless? And so, in all seriousness, a special committee was appointed and ideas were

not lacking. The one idea which seemed to hold out hope, namely, that a very poor quality cycle tire might be made from leather, was eventually abandoned because leather supply was in more desperate straits than rubber. It ought to be said that many of the industry's best technicians, realizing the gravity of the situation, did all they could to help in the quest.

It would be illogical to regard all these circumstances as proof of the lasting value of the pneumatic tire. A more positive approach is to study the characteristics of the tire and the value of these to the motor vehicle user.

We begin with the original success of the pneumatic cycle tire, due to its spreading the load over a rather loose surface, not sinking in, and thus avoiding to a large extent tractive resistance. On metalled roads the resilience of the tire gave greater comfort at higher speed than did the solid cushion. Incidentally, a smaller wheel and greater safety was to some extent brought about by pneumatic tires. These two characteristics having popularized it, there were minor improvements in the method of attachment, in the incorporation of non-skid devices, such as metal studs, and later, rubber studs or blocks.

The special tires for use in sand, the cross-country (heavy treaded) tires, were no more than old ideas adapted to the special needs of war. So far it is possible at least to imagine that some alternative might be found by using articulated wheels with pads, and it is not until we come to consider the refinements of motor vehicle design that the pneumatic principle seems to have no alternative.

The problem of steering a car, including the effort required by the driver, and the ease and certainty with which the car follows the course willed by the driver, has been in large measure solved by the pneumatic tire. If one were to carry into literal practice what is so often done metaphorically, the putting of the cart before the horse, the driver's problem of steering would have been almost insuperable. There would be no certainty that the meticulously responsive horse could propel a cart through a gateway little wider than the cart, and a canter along a straight road would be disastrous. One of the problems of the horseless carriage was to steer it. The sideways pull of the horse had to be replaced. With steel tires it is possible at low speeds on a fairly smooth road to steer a vehicle by turning the front wheels in the desired direction, but even under these favorable circumstances it would be a rough and ready result.

To give accurate steering there must be a certain and fairly large area of contact between the ground and the tire and the portion of tire in contact must be positively directed by the driver. A large area of contact provides another prerequisite of good steering by maintaining contact on uneven surfaces. A bouncing wheel on the front end of a motor car is a frightening thing and can be tested by over-inflating the tire. The vehicle designer, on his part, has a difficult problem, and the extent to which he and the tire designer have succeeded can be experienced in driving any good motor car not more than a few years old.

Now that roads have become so smooth, wide and generally suited to high speed, the control of the vehicle—in the main its "steerability"—is of first importance. Without this attribute the user would not be able to employ the full capabilities of his vehicle.

The driver has tended naturally to associate tires with comfort and durability rather than with controllability. It is always possible to have larger and softer tires and so to gain increased comfort. In the years 1920 to 1925 there was a marked development in this direction. Over a few years the 3½ in. tire had given place to one of 5¼ in.; the 5 in. tire to one of 7½ in. Inflation pressures dropped from 60 or 80 lb. to 20 or 30 lb. per sq. in. To accommodate the tires, wheels had to be reduced in diameter.

Experience proved that these extremes had certain disadvantages. Apart from controlling power, there were important questions of first cost, vulnerability, appearance and rate of attrition. After a few more years an intermediate range of tires evolved under the combined pressure of circumstances. The 5¼ in. tire was replaced by one of 4½ in. or 4¾ in., the 7½ in. tire by one of 6 in. or 6½ in., with corresponding increases in inflation pressure. Wheels, however, remained of the smaller diameter and aided the motor car designer in lowering the center of gravity of his vehicle, improving its appearance and controllability.

In the meantime, the advantage of pneumatic tires from the point of view of road maintenance was having its effects, resulting in legislation which virtually banned even the solid rubber tire from commercial vehicles. Roads became smoother, remained smooth with less attention, and this circumstance no doubt influenced the return to the intermediate size of tire just mentioned. There was a balanced co-development of tire and road.

When all is said and done the irregularities of road surface of the kind represented by a pot-hole, a badly laid level crossing, a wavy road, a poorly-engineered road, have to be absorbed by the springs of the vehicle. The four or five inches of possible tire deflection (and the safe one or two inches) are quite inadequate. Springs must be able to deflect five or six inches. The problem of recent years has been to determine the rightful place of the tire in the general design of the vehicle. Consideration of these and kindred problems, such as tractive resistance and weight, leads one to think that the pneumatic tire is firmly established and will not be superseded by any other invention. It was apparently a case of the inventor inventing better than he knew.

It is by no means suggested that the pneumatic tire has arrived at its final state of development. In details of design, of compounding, there seems to be a never-ending, though unspectacular, process of development, whether to meet the changing demands of users, the changing circumstances of road and driving methods, or to take advantage of improved manufacturing techniques. Still more important are the employment of new materials, particularly textile fibres. It is fairly safe to assume that as and when motor vehicles increase in numbers and mileage run, tires will be needed in due proportion. If road transport, including private motoring, increases as it might do in the so-called "backward" countries, even to a quite minor extent, the tire section of the industry might in a few years consume rubber at the rate of a million tons per annum—as much as the whole industry used to consume.

In the short time at my disposal I cannot mention more than a few of the other important rubber products. Before starting on them we may usefully note the remarkable properties of rubber as they are displayed in tires. There is nothing exceptional in a tire running over 100,000 miles, and in the contained rub-

ber being subjected to something like 50,000,000 stress reversals without losing its toughness and elasticity. The limit of distance run by a tire is in practice set by the imperfections of bonding between rubber and textile materials and by the gradual attrition of the surface of rubber which touches the road. Rubber itself, suitably compounded, and used in a tire well-proportioned to load and speed of vehicle, undergoes no important change, except at exposed surfaces. The lapse of years has little effect, as instanced in electric cables, rubber flooring, upholstery, and a hundred other classes of goods where the rubber is protected from light and extremes of temperature.

Tires illustrate another notable characteristic of rubber, namely, its great elasticity, in the scientific sense. From large deformations, compared with those which take place in metals and other materials, rubber will return promptly and absorb but a small part of the energy as heat. This property has to be compromised in practice because the materials which give the greatest resistance to attrition adversely affect elasticity. When attrition is not to be encountered, full advantage can be taken of rubber's elasticity, as in engine mountings, tire tubes, upholstery.

Industrial Belting: For conveying minerals long distances, a belt must have great strength, combined with flexibility. The properties which make rubber so essential in tires are of great value here. There is no other material which combines so great a flexibility with so great a toughness as is required for the surface on which the mineral falls and is carried; nor is there another material capable of binding securely together into a flexible whole the various sheets of cloth which give strength to the belt. In this case also there seems no possibility of belting being lost to the rubber industry. On the other hand, there is an obvious need for more mines, more mechanization of existing mines, if the mining industries are to keep pace with the hoped-for increase in the world's standard of living.

Footwear: Rubber is not essential for footwear, and the future of rubber footwear is, therefore, of special interest. There is a rivalry of properties. Leather is less durable than rubber but is slightly porous and so gives greater comfort under certain conditions. Another advantage of leather is its non-slipping property compared with rubber, on wet or slimy smooth surfaces. In the public mind, the appearance and finish obtainable in a leather shoe are, perhaps by custom, preferred.

But shoes are required on many occasions when the properties of rubber, flexibility, "dry" grip, and durability, give undoubted and spectacular advantages; flexibility in sports shoes, dry grip for the gymnasium, durability for walking shoe soles, waterproofing for industrial as well as for sports purposes. It seems to be generally true that a cheap rubber shoe can be cheaper than a cheap leather shoe and this is important in countries like India.

In this section of the industry rubber has obviously come to stay and its future is bright indeed; for a higher standard of life will increase the demand for sports and specialty shoes, and for industrial boots in the industrialized countries, while the cheaper varieties have a great field in the "backward" countries.

Upholstery: The virtual beginning of this section of the rubber industry dates from the year 1928, when a process of foaming and setting latex was first put on a sound commercial basis. Without doubt, sponge rubber upholstery was the biggest development in the industry in the between-war years. The reasons for success are not far to seek. Foamed latex, unlike blown sponge, is porous: air and water will pass freely through it. The slight movement of a passenger on a latex sponge seat causes ventilation. There is no risk of broken springs, any desired degree of comfort can be given, and the material lends itself to molding into complicated shapes.

In 1942, the world stocks of latex, unlike those of dry rubber, were at no more than a normal commercial level, and as a consequence the production of latex upholstery had to be cut down almost to zero. The war had made enormous demands on it for component parts of fighting vehicles and military transport vehicles, for hospital use. Unfortunately there was no synthetic latex available, at any rate of the right quality, and unsatisfactory improvization had to be made.

Having regard to the great interest already shown in this material, both here and in the U.S.A., it would not be surprising to find a consumption annually corresponding to 40,000 tons dry weight of rubber within a year or two, or as soon as latex becomes available, and consumption will probably require several times that quantity each year in the more distant future.

Goods to Meet the General Demand of the Public: The public demands a great variety of goods made from rubber (hot water bottles, sports balls, waterproofed fabrics and garments, garden hose), and it seems unlikely that any new development will reduce the demand for such products. Their sales volume is a useful index of general prosperity. It is possible, as in the case of tires and belting, to give adequate technical reasons for the success of most of this group.

In addition to products recognized by the public as made principally from rubber, many others contain rubber in more or less proportion. Vacuum cleaners, wireless (radio) sets, leather footwear, even household furniture, to name only a few, contain some rubber parts.

Rubber as an Engineering Material: In this field great developments have taken place, before and during the war. Aircraft constructors, civil and mechanical engineers, automobile engineers, manufacturers of scientific instruments, of weighing machines, of refrigerators, have learned much in the last fifteen years concerning rubber and what can be done with it.

As a construction material rubber offers a unique combination of properties, low specific gravity (0.93), large elastic deformation without rupture, high energy storage when deformed, electric insulation, durability under repeated stress cycles, chemical inertness to a marked degree. Further, rubber can be adapted by suitable compounding and treatment to give any desired hardness, color, or shape. It is rare to find that a rubber manufacturer cannot offer at least a technical solution of a construction problem.

But the development of this field depends not merely on the recognition of the value of rubber as a material. A much wider potentiality is open to the engineer and constructor. The use of rubber often facilitates a quite drastic re-design and simplification of constructional methods. Rubber mountings of power units in motor cars and airplanes have made possible much lighter general structures. The application of rubber to ships' propeller bearings, to railway brake-hose couplings, is but the mere shadow of things to come.

The part played by rubber in the war gives con-

fidence to the rubber manufacturers in the potentialities for the future, and has demonstrated the rapidly widening recognition by engineers of the value of rubber. Vibration insulation gives greater comfort to passengers in vehicles, better working conditions in factories, reduced maintenance cost of engineering installations, and often simpler and cheaper methods of construction. The surface of this problem has been scratched, but the good earth has not been turned over.

The use of rubber as a cushion between the steel tire and the hub of a railway vehicle has hardly commenced. Rubber manufacturers have been ready with designs, but railway and tramway engineers have visualized possible hazards rather than positive advantages. Risk of fire, of premature failure, the abandonment of a technique in metal gathered over a hundred years of experience—all these have weighted against the certainty of lower maintenance costs of vehicle and track, of greater comfort and less noise for passengers. No one who has observed the street cars of Washington, D. C., can fail to be convinced of the ultimate extensive use of rubber in rail-wheels.

Heavy machinery, such as rubber mixing mills, has been mounted on rubber, with remarkable results in silence and lack of vibration transmitted to the building. Of course, the problem is not solved by simply putting rubber blocks between the machine and its foundation. In any particular case, the nature of the vibration to be absorbed must be determined, and the rubber mounting must be designed to avoid resonance at the usual speeds of working. That both mechanical engineers and rubber technologists are conscious of the problem, and are beginning to work together, augurs well for the future of this branch of the industry.

Roadways: When rubber was very cheap, about the year 1932, great efforts were made to seize the opportunity to create new uses for rubber. Experience showed that there is a certain natural rate of development, of all industries taken as a whole, and revolutionary expansion cannot occur within a few years. It is not merely a question of inertia, though inertia is all too common. Time is required to test and to develop, to convince possible users, and for these latter to apply the results.

In the case of rubber roadways rubber is so flexible and elastic that complex devices had to be used to hold it in place. As a general rule the cost of laying a rubber roadway, with rubber at a low price, was greater than that of laying most other types. And what advantage could be claimed? In the early days of the century, when busy streets were often so noisy as to make conversation impossible, when it was not uncommon to lay soft materials, like bark, in front of houses where people lay sick, when office work with windows open was a nervous strain, when people were awakened in the early morning by the clatter of traffic, then a resilient road would have been a godsend. In 1932, however, the traffic was mainly running on rubber tires, the roads were smoother, and to some extent sound-deadening, and thus the rubber roadway was not as attractive.

There are, and always will be, special cases. In spite of the additional cost, rubber will probably find use on roads adjacent to hospitals and other institutions where, either because of the need for mental concentration, or for quietness as a function of dignity, the harsh sound of the occasional horse-shoe and steel tire must be muffled. From all this will be gathered the impression that I do not attach much importance, reckoned quantitatively, to the development. This and other efforts of rubber growers and rubber manufacturers to exploit the potentialities of cheap rubber, proved in the main fruitless.

Conservation and Output: On the other hand, the urgent situation arising from the loss of rubber-producing territories, and the need to conserve manpower and other facilities for prosecuting the war, did not result in a dramatic curtailment of the industry. True, after a short time, hurried decisions were taken, resulting in a reduction of consumption of 40 per cent. The need for products, even of necessarily inferior quality, was not diminished. The greater use of reclaimed rubber and other substitutes resulted in a net reduction of output, expressed as weight, by only some 25 per cent. It was soon clear that even this was far too severe, and intense, though mainly unavailing, efforts were made to re-man the industry.

These two circumstances of surplus and of scarcity and the relative small effects of either of them on the total weight of production, indicate clearly that the industry rests on a stable foundation of essential public demand. It has developed and can develop much more rapidly, on this foundation, not only in step with the general expansion of business, but as a result of establishing itself in new fields.

New Materials in the Rubber Industry: We are concerned here not with the production of crude rubber but with the manufacture of certain groups of articles and materials. Whereas the industry was founded upon rubber, it is no longer possible to define a rubber factory as one where rubber is treated. There are many rubber "substitutes," like vulcanized oil, many "near synthetic" rubbers, like neoprene, copolymers of butadiene and styrene, many elastomers among the plastics and synthetic resin group, and even "analogues" of rubber, e.g., the silicones.

The rubber industry is concerned with the manufacture of goods and materials mainly of an elastic character, and to a less degree of an electric insulating character. The impact of new materials has not, and will not, create a sudden revolution and the word "rubber" will, as time goes on, cease to mean "a product of *Hevea brasiliensis*," and come to embrace whole families of elastic substances. Already it is necessary to use the term "natural rubber" in contradistinction to other kinds.

Great as were the war-time difficulties of the industry in adapting itself to the use of the famous GR-S type of synthetic rubber, the general methods of factories remained the same in kind: no major upheaval resulted. Had there been less urgency the transition could have been effected with no loss of production.

The advent of new materials, notably neoprene and Perbunan, gave the rubber manufacturers fresh opportunities. The disintegration of rubber by certain oils had limited its use to a small extent, and this limitation was then removed. Before the war oil-resistant types of rubber had been used and the demands of war gave a great impetus to their development. It is unlikely, however, that materials of this type will find more than a small market, in comparison with that for rubber as a whole.

At the moment of giving this lecture it is clear that natural rubber is regarded as by far the best for general use. Synthetic materials, as made available so far,

lack the high degree of elasticity, power of quick recovery from strain, or as the experienced rubber manufacturer would put it, the new materials lack "snap." Two interesting examples are worth noting. As a result of this lack of "snap," GR-S in tires causes them to run hotter, in elastic garments gives reduced power to control.

Neither has the high tenacity of rubber been equalled by synthetic rubbers, with the result that natural rubber has easily held its own in tires, conveyor belting and most other products. These circumstances are too well-known to need more amplification and it is sufficient to record them. What is of much greater interest is the possible future development in the field of macro-molecules, as applicable to the rubber industry.

In the early days of our industry the principal development was on the chemical side and although the general progress of engineering and of manufacturing machinery had its effect, the position of the industry, technically, was much the same in 1900 as it had been in 1860. An extreme illustration lies in the fact that a certain plant for manufacturing cut sheet tobacco pouches, complete with sulfur bath, was in continuous use from about 1860 to 1930. Then followed a period, from 1900 or soon afterwards to about 1935, when the principal development was refinement in compounding and treatment, on an empirical basis, with the general object of improving the quality of goods produced, or adapting them to specific uses.

At the same time, our industry, like many others, underwent considerable changes in manufacturing technique, the use of more and of better machines. Chemical development was not stagnant but had reached a point beyond which it could not pass without the aid of modern physico-chemical research into molecular structure. It is of interest to note that little more was known of the physical molecular changes called vulcanization in 1920 than in 1860. Here is a clear example of the importance of fundamental research if practical industrial development is to proceed. Or it might be more correct to say that industrial development depends on and must wait for fundamental scientific research.

In the world we may now call modern the great extension of knowledge of molecular physics and chemistry has had its repercussion on our industry. Under economic stress, or at least a desire for economic self-sufficiency, Germany and Russia were eager to apply this new knowledge to the production of synthetic rubber. Rubber manufacturers in other countries had a passive interest, but oil and chemical companies, as suppliers of materials, played an extremely active role. Under the threat of war in the Pacific, American rubber manufacturers, from 1938 onwards, did a great deal to foster the development of synthetic rubber by research into molecular changes and polymerization, with the result that the U.S.A. was able, between the end of 1941 and the middle of 1943, to set up a synthetic rubber capacity of over half-a-million tons per annum and to increase it to nearly a million tons by the middle of 1945.

There is no more, and no less, hope of finding raw materials better adapted than any known at present to the needs of our industry than there was hope of making electric generators when Faraday was studying the behavior of magnets and coils of wire. The extent and complexity of the electric power supply were clearly beyond the wildest dreams of men at that time. All that we, on our part, can do is to learn as assiduously as we can the fundamentals, and be ready to make sacrifices of time and money on those applications of research which seem to contain a germ of advancement.

It has been stated by some that, with the apparatus and technique commonly employed in copolymerization, the unique properties of rubber cannot be reproduced, and on the contrary, by others, that we are on the verge of important discoveries, which will yield materials superior to rubber. If this is so, rubber manufacturers will be ready to make use of them.

What is of more practical interest is that the raw materials of our industry may tend to include monomers, which may be polymerized into special products to meet special needs, by controlling suitably the conditions of the reaction.

For the first time the scientific foundation of many industries, including our own, is being surveyed; much is being learned and far-reaching developments are inevitable as a result. Empiricism is being superseded by true scientific method, and as a result we may confidently hope that the users of rubber products will be better served, and those who make them will work under better conditions, with improved tools, with suitable rewards for their skill, their work and their spirit of adventure.

General Conclusions

A general impression of optimism has by now been created. Reasons have been adduced to suggest that the industry is ripe for rapid expansion, that the new knowledge of molecular structure and its application will accelerate rather than retard the growth of rubber manufacture. It is necessary to make some reference to the availability of raw materials to enable the expansion to take place. One must shelter behind the assumption that the next decade will see a revival of international trade, an extension of world markets and, of course, the absence of a major war.

Given all these there remains the fact that rubber trees planted now will not yield rubber until some seven years hence. We can hope that within two years the world will produce more natural rubber than it ever did before. Improved technique on the plantations and other factors will contribute their quota of additional production. And there is the enormous potential production of synthetic rubber in the U.S.A. and other countries. In two years' time there might be made available some 2½ million tons of rubber, of one kind or another, per annum.

The manufacturing industry has been expanded during the war and is probably able to consume in 1946 some 1,300,000 tons. Broadly speaking, there should be no need for production to be retarded for lack of materials. The public would not be seriously inconvenienced by the use of a small percentage of synthetic rubber and this condition might well remain until additional supplies of natural rubber could be provided.

If economic conditions are favorable there are reasons for expecting a very large increase in the requirements of rubber during the next ten years, not merely to make up the present deficiency of manufactured goods or to accommodate a general industrial expansion, but also to meet many new demands, in furtherance of an improved industrial efficiency, and of a higher general standard of life.

Bonding Rubber to Metal with Ty-Ply

By ROBERT SHATTUCK
Vice-President, Marbon Corp., Gary, Indiana

MUCH of the world's progress has depended on the joining together of materials. Wood, as a structural material, was of little value until methods were devised to join pieces together. Dowel pins, mortices, glue joints, nails, wood screws, bolts, etc., have made possible all of the wood construction we now have. Similarly, the use of forge welding, bolts, rivets, gas and electric welding has made possible the metal fabricating industries we now have.

It is said a chemist was once asked if it were possible to join steel with rubber and he replied that it was not possible to join steel, a mineral, with rubber, a vegetable, but, as we all know, it has been done very successfully during the last twenty-five years. I believe this is highly significant because it is a new and radical departure from all former methods and will find thousands of applications.

Joining a metal assembly with rubber is not a new idea. Almost one hundred years ago Charles Goodyear reported a successful bond between a metal and a hard rubber stock. Numerous other principles have been used, such as adhesives based on shellac, various rubber isomers, and surface modification of the rubber with sulfuric acid. However, the first large scale production was carried on in the 1920's when the brass-plating method came into general use. It was possible to get a very strong bond using the brass-plating method and a demand arose for this sort of assembly, especially in the automotive field.

Principal Requirements

However, the brass-plating method was not without problems, such as the proper copper zinc ratio, current density, alkalinity of the plating solution, metal porosity, and rubber compounding—not to mention the substantial capital investment tied up in brass-plating equipment. Obviously, this intensified the search for a liquid adhesive that could do such a job. The principal requirements of this adhesive are:

A. One coat application.
B. Application as simple as applying a coat of paint.
C. Low cost.
D. Suitability for use in a conventional rubber cure.
E. Versatility for use with a wide range of stocks of various hardnesses, etc.
F. High bond strengths at both high and low temperatures.
G. Permanency of adhesive film location—resistance to wiping during cure.

The Ty-Ply line of adhesives satisfies these requirements and has been very well received by the rubber industry. Ty-Ply is a black, free-flowing liquid, consisting essentially of natural rubber and rubber substitute derivatives in solution, together with dispersed solids. We have never been able to arrive at a simple hypothesis for the adhesion of rubber to metal. Consequently, the development of this line of rubber-to-metal adhesives has amounted to the study and evaluation of combinations of all materials that were thought to be capable of uniting chemically metal (in most cases steel) with rubber. For example, Ty-Ply R for use with crude rubber stocks was the 313th such combination. In the interest of achieving greater cement storage stability Ty-Ply R was replaced with Ty-Ply Q, the 584th combination.

Ty-Ply was put on the market in 1939 with the R. T. Vanderbilt Co. acting as the exclusive sales agent. Apart from the United States, it is regularly shipped to manufacturers in Canada, Mexico, South America, England, France, Russia, India and Australia. Some of the end uses are: vibration dampeners, oil seals, motor mounts, spring bumpers, shock absorbers, tail pipes support brackets, solid tires, industrial wheels, industrial casters, industrial rolls, wringer rolls, rubber lined tanks, ventilating ducts, bogie wheels, track blocks, fender guards, and pedal pads.

The use of Ty-Ply is not complicated but I felt it might be helpful if I could point out some of the factors involved such as the selection of the type of Ty-Ply, compounding of covering cements, compounding of rubber stock, methods of curing and test results.

Selection of Type

Ty-Ply Q is designed for bonding non-oil resistant types of rubber to metal, such as crude rubber and GR-S. Ty-Ply S is designed for bonding the oil resisting types, such as neoprene and Buna N. Both are sold at brushing consistency but can be diluted for spraying or dipping. Coal Tar Xylol 10° range is recommended as a diluent. Ty-Ply should not be stored for long periods. In general, we do not recommend storing it for over six months.

It is important that Ty-Ply be thoroughly stirred before it is removed from the shipping container for use. The solids present must be thoroughly dispersed to get good results. A detailed procedure for doing this job is outlined in the Vanderbilt Technical Booklet No. 16B.

Rubber Cement

The use of a covering rubber cement is not necessary for adhesion purposes but some applications require it for the sake of building tack. Further, if it is intended to store a Ty-Ply coated metal for more than two days, the surface should be protected with a coat of rubber cement.

Note: This article is based on a paper delivered by the author before the Chicago Rubber Group at Chicago, Ill., on March 21, 1947.

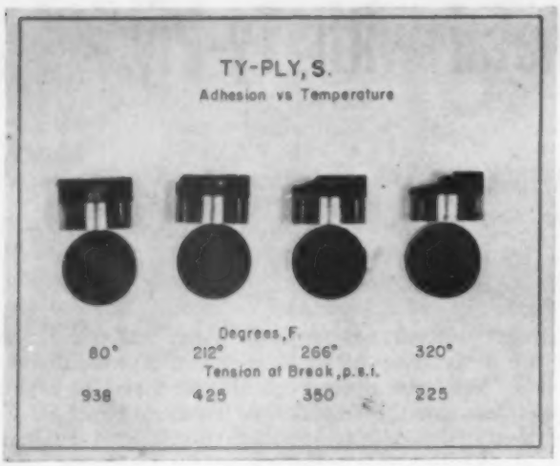


FIG. 1.

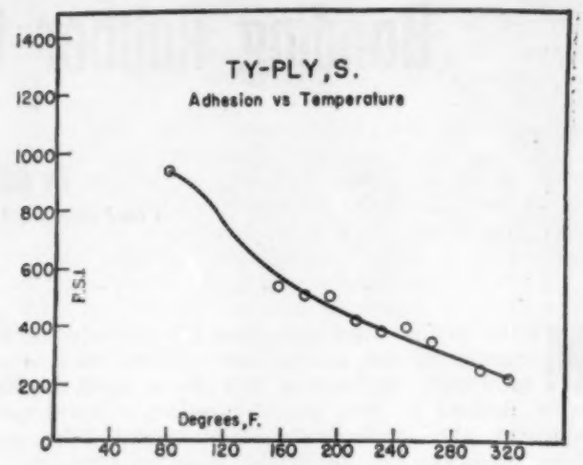


FIG. 2.

The stock used in the rubber cement should be approximately the same as that to be bonded. If the principal stock is highly plasticized however, a better bond can usually be obtained if all or part of the softener is omitted in the stock to be used for the cement. It is with the same principle in mind that a tie gum is sometimes used.

The solvent used in the rubber cement should have a boiling range high enough to avoid moisture condensation under conditions of high humidity and rapid air movement but not so high that the drying period is unduly prolonged. A solvent with a minimum boiling point of 200°F. and a maximum of 350°F. is recommended. Of course, the solvent should be free from any oily residue.

It is also desirable that the rubber cement solvent not dissolve or excessively soften the uncured Ty-Ply film. This is more important in brushing and dipping operations than in spraying operations. For natural rubber and GR-S covering cement stocks solvents composed essentially of aliphatic hydrocarbons are advised. A few examples might be: Apco Thinner, Skellysolve L, Apcolene, V. M. & P. Naphtha, Amsco Lactol Spirits, Stanolind Cleaners' Naphtha. Any of the commercial petroleum solvents are suitable, providing the Kauri-Butanol value is not over 40 and providing they have the proper boiling range.

Neoprene solvents are, in general, also solvents for Ty-Ply, but we find that a mixture of one part of aromatic and two parts of aliphatic hydrocarbon will make a satisfactory solvent for neoprene and, at the same time, not soften the Ty-Ply unduly. The two solvents should either have about the same evaporation rate or the petroleum solvent should be the slower drying of the two. An example of such a combination would be one part of Toluene with two parts of Troluoil.

Buna N type rubbers require higher solvency than neoprene and crude rubber. Consequently, if the manufacturer desires to use a covering cement, spraying would be the preferred method of application. However, the cement can be brushed on, if the operator does the job carefully, to avoid lifting the Ty-Ply film.

If metals are free from rust or scale, usually it is only necessary to degrease them. A vapor bath of trichloroethylene is satisfactory for this purpose. Metals having rust or scale on their surface should first be degreased, then shot or sand blasted, and finally degreased again before use. The shot used should be tested periodically to be sure it hasn't become coated with oil or grease. For nonporous metals pickling is satisfactory, but metals which have been pickled should be neutralized with an alkaline solution and washed and dried before the Ty-Ply is applied.

Another practice, known as the DuPont Method, removes scale by the use of molten caustic at 700°F., along with a small amount of sodium hydride. This cannot be used on aluminum, however. There is still another method, known as the Kolene Process, where metals are processed in a hot salt bath followed by sulfuric acid and water. It is claimed that all scale, carbon, and brass plating can be removed by this process. Once the metals have been properly prepared they should not be touched by the hands.

Compounding

No special consideration need be given to curing agents and activators as Ty-Ply cures very well with almost any combination. However, as it is true in brass-plating adhesion, it is also true in the Ty-Ply bond that a tight cure is desirable. Sulfur is most commonly used but the Ty-Ply cure does not demand it as a very excellent bond can be made to a sulfurless stock.

Adhesion on any compound can be weakened by the use of excessive amounts of some materials, such as plasticizers and sunproofing agents, but it is possible to compound for almost any sort of physical characteristics, common to rubber stocks, and get excellent adhesion.

Due to the nature of most rubber-to-metal work, press cures are the common practice. However, we have found that an open steam cure gives very good results. No covering rubber cement is required if the stock has sufficient tack to stick to the adhesive coated surface when rolled down.

Bond Characteristics and Tests

In checking various adhesives and stocks in our laboratory, it is customary for us to run these on circular

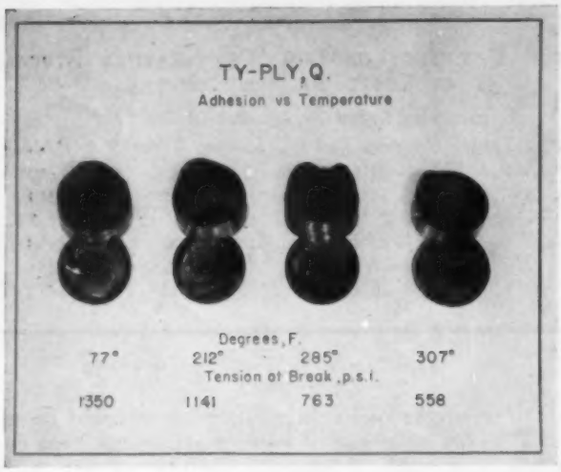


FIG. 3.

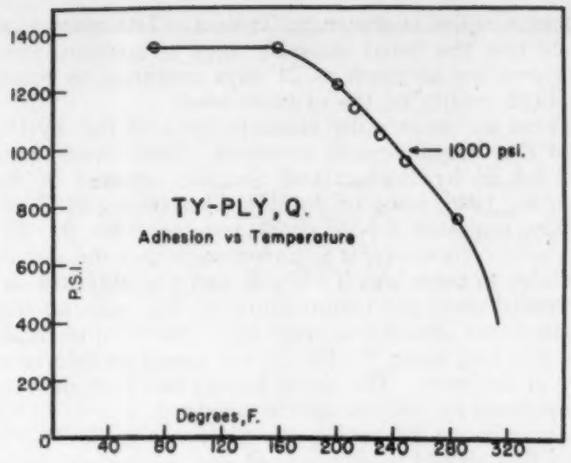


FIG. 4.

test buttons having a one square inch area. Harder stocks give generally higher pulls than the soft stocks but it is interesting to note, in every case, that the failure is in the rubber stock rather than the adhesive film. The reason for the variations in the tensiles on various hardness stocks is that the stock itself is not actually under a true tensile measurement but rather a combination of tensile and tear.

This might further be shown by noting that a tread stock might have a tensile of 4000 pounds when tested in the conventional manner, using a dumbbell sample, but a one square inch cross section of rubber vulcanized between two metal buttons would test perhaps 1400 pounds—the break being in the rubber and illustrating that a true tensile is not represented.

One very desirable property of the Ty-Ply bond is that the strength at curing temperatures is high enough to permit easy removal from a hot mold. The limiting factors, in this case, would lie in the rubber stock rather than in the bond itself.

The accompanying illustrations serve to illustrate the nature of the bond and the rubber stock when subjected to a variety of conditions. They illustrate test button assemblies broken at various temperatures, after normal room temperature aging and after accelerated aging in an air oven at 212°F. The principal significance of this series of investigations is that the weakest link of the rubber-metal assembly invariably lies in the rubber stock. It should be pointed out again that the basic reason for this is that a tensile test of the rubber-to-metal assembly is not a true tensile but a combination of tensile and tear.

Figure 1 shows neoprene-to-steel specimens, the test results being plotted in Figure 2, while Figure 3 shows natural rubber-to-steel specimens, with these test results in Figure 4. All buttons for these tests were cured for 20 minutes at 320° F., cooled overnight, heated for one hour at the indicated temperature, and broken hot, all breaks being in the rubber.

The effects of extended aging (24 days at 212° F.) on natural rubber-to-steel specimens are indicated in Figure 5. It will be noted that an outer layer or sleeve of hardened rubber has developed as a result of the accelerated aging, but the Ty-Ply bond itself appears to be unaffected. Tensiles on buttons such as those shown in Figure 5 are plotted in Figure 6. Tests represented by a solid line were made on buttons that were removed from the aging oven and cooled overnight, prior to testing.

The effect of low temperature storage of cured

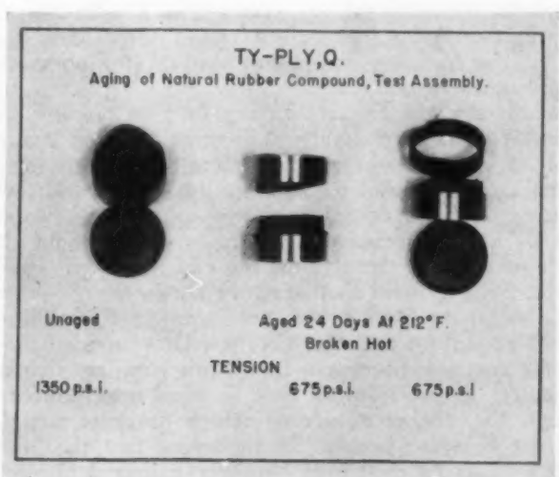


FIG. 5.

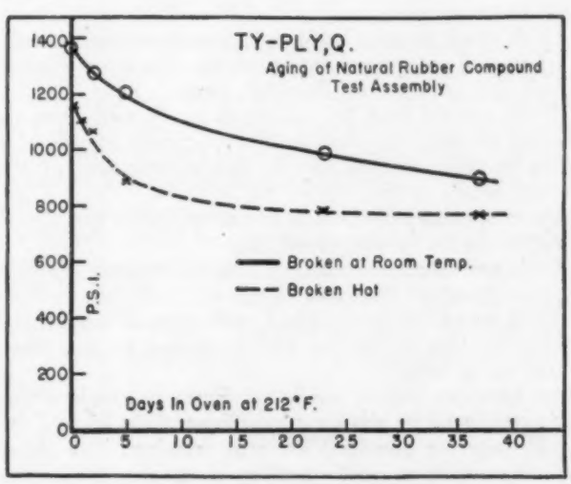


FIG. 6.

rubber samples is shown in Table I. The results indicate that the cured assembly aged at sub-zero temperatures for as much as 21 days continues to retain the high quality of the original bond.

There are some other characteristics of the Ty-Ply bond that might deserve comment. Some work done in England by Buchan and Shanks, reported in the October, 1946, issue of *Rubber Chemistry and Technology*, indicated a poor shock resistance for the Ty-Ply bond. However, it is unfortunate that the sample available to them was Ty-Ply R and probably had deteriorated since the manufacture of this material was discontinued almost five years ago. We tried to duplicate this test, using Ty-Ply Q, but found no deterioration in the bond. The shock impact was then doubled in the test and still no failure appeared.

There is one interesting characteristic of the Ty-Ply bond that should be emphasized and, in fact, might be a factor involved in the shock testing. The bond of rubber to any stiff metal section using Ty-Ply is excellent immediately after curing but, if a thin metal is used, flexing immediately after curing will damage the bond. After aging for one week, the bond is excellent even on very thin sections that are flexed.

It also follows that the resistance of the Ty-Ply bond to a 100% humidity test, immediately after curing, is detrimental but after one week's aging such a test does not seem to affect the bond. The chemical nature of this secondary change is not known to us and the only place we have ever seen its effect is on laboratory breakdown tests.

As I mentioned at the outset, the successful adhesion of rubber to metal by means of brass-plating opened a new field and represented a significant progressive step in the art of fabrication. The development of a simple one coat adhesive that could be applied as easily as a coat of paint and the resultant cost economy has made it possible for any rubber goods manufacturer to do rubber to metal work. Consequently, the scope of products made has attracted widespread attention in many types of manufacturing.

At one time the attachment of rubber to metal was not looked upon with favor by designers but the widespread success of bonding rubber to metal has opened a new line of machine design. Rubber can now be considered a good structural material and it appears that, in the next few years, a multitude of new applications will materialize because the unique properties of rubber to damp vibration and absorb shock cannot be matched by any metal to metal connection.

Like friction, vibration has always been a cause for failure of all sorts of machines. I believe the obvious advantages of the rubber to metal connection will cause it to be looked upon as a revolutionary improvement in the field of machine design.

TABLE I—EFFECT OF LOW TEMPERATURE STORAGE OF CURED RUBBER SAMPLES

(Samples Cured 30 Minutes at 307° F.)

Testing Temp.	*Storing Temp.*	*Storing Time*	*P.S.I.*
80°F.	80°F.	4 Days	1240
32°F.	32°F.	1 Hour	1240
32°F.	—25°F.	1 Day	1135
32°F.	—25°F.	7 Days	1150
32°F.	—25°F.	14 Days	1245
32°F.	—25°F.	21 Days	1215

Additional Data on the Goodrich Puncture-Sealing Tubeless Tire

ADDITIONAL information has been made available by the B. F. Goodrich Co., Akron, on its new puncture-sealing tubeless tire. According to the company, the tubeless tire is the same general size and shape of a conventional tire casing, but it has five construction features in which it differs from the standard casing. These features are:

(1) A thick layer of gummy, puncture-sealing rubber of special compound that lines the inside of the tire through the crown and shoulder areas.

(2) A special first ply which is made with non-air diffusing rubber, the successful application of which is said to be the principal key in the achievement of the practical tubeless tire.

(3) A specially molded bead toe to enable the tire to be seated tightly in the wheel rim.

(4) Small concentric ridges molded around the outside rising part of the bead.

(5) A valve stem equipped with rubber and metal washers so that it can be tightly sealed in the rim's regular valve hole.

The tubeless tire is made of four-ply construction and is produced in sizes ranging from 6.00-16 to 7.00-15. It may be mounted on any standard full drop-center rim, such as used on all modern cars, which can be made air-tight. Since most truck rims are made with a split rim base or a loose side flange, these rims presently cannot be sealed against loss of air. Certain special applications in airplane tires are being studied by Goodrich.

In mounting the tubeless tire, the valve stem must first be fastened in the existing valve hole in the rim. The tire is then mounted on the rim in the same manner as the conventional tire with a degree of caution to prevent damaging the sealing ridges molded on the bead. The company warns that bead or rim lubricants should not be used.

Inflation of the tire is accomplished by holding the assembly in its normal vertical position and first bouncing it several times at various points on the periphery, which kicks the bead out against the flange, and then inflating from a compressed air supply. Fifty per cent of normal inflation pressure is said to hold the beads of the new tire against the rim flange with sufficient force to form a satisfactory air seal.

Although no special tools are required in mounting and dismounting the new tire, special equipment and instructions are necessary in making repairs such as punctures in the sidewall area, a tread area puncture or cut, the size or nature of which prevents airtight seal, or a bruise break. In the event that the inner liner of the tubeless tire becomes damaged through accident to the extent that it will no longer retain air, the tire may be mounted with a regular tube.

Editorials . . . . . .

Rubber Legislation

IT NOW SEEMS definite that the passage of permanent rubber legislation will not occur during the current session of Congress. It was originally the hope of Representative Paul Shafer (Rep., Mich.), who heads the subcommittee of the House Armed Services Committee charged with investigation of the rubber industry, that such legislation could not only be submitted to the present Congress but that passage could be obtained. Present regulations governing the rubber industry expire on March 31 of next year and therefore the industry must live with the present regulations for at least the next seven or eight months. Modifications of Rubber Order R-1 will of course be made from time to time, but the basic regulations will remain in effect.

Mr. Shafer's subcommittee has been intensively studying suitable legislation for the past several months and has drawn up a proposed bill. The presentation of this bill to Congress was held up pending the submission to the subcommittee of specific recommendations for long term legislation by a special subcommittee of the Army-Navy Munitions Board. These recommendations were submitted to the House subcommittee on June 20. They took the form of a proposed bill. And therein is the answer to the postponement of permanent rubber legislation until next year.

Although the contents of the bill proposed by the Army-Navy Munitions Board have not been revealed because "revelation at this time might prompt immediate sniping by the industry," it is understood that the legislation proposed is similar to that recommended by the former Inter-Agency Rubber Policy Committee. According to Representative Shafer it does not reflect the viewpoint of the industry and contains proposals which "the industry could not live with." Mr. Shafer knows whereof he speaks in this instance because his subcommittee has received dozens of concrete suggestions for rubber legislation as the result of hundreds of questionnaires mailed to rubber manufacturers. The bill proposed by the Munitions Board was accompanied by a report outlining the views of the industry, but is reported not to embody the major recommendations made by it.

As near as can be determined, the bill proposed by the Munitions Board is somewhat on the bureaucratic side. A clue in this direction was supplied by Mr. Shafer who recently indicated that while "we want to protect the synthetic rubber industry, we don't need all of these regulations." In further comment on the Munitions Board's recommendations, the House subcommittee chairman stated "we don't want a bill that will create another big government bureau."

Because of the divergence of opinions, no permanent rubber legislation will be attempted during the present Congress. What manner, shape or form the eventual legislation will take is anybody's guess at this point. But this much is known: Any bill submitted to Congress will probably assure the consumption of a substantial amount of synthetic rubber. There is general agreement on this score, although again opinion varies as to what constitutes a "substantial amount" where synthetic rubber is concerned.

Originally, there was general agreement on a ratio of one-third synthetic to two-thirds of natural rubber. Lately, however, a number of leading rubber executives have changed their thinking to the point where they are now recommending minimum compulsory consumption of between 100,000 to 150,000 long tons only per annum. In this respect the House subcommittee has indicated that its bill will involve the manufacture "of a more or less specific amount of synthetic rubber which will represent the minimum necessary to maintain a technically advanced and rapidly expandable industry."

Presuming agreement on the minimum amount of synthetic rubber to be consumed annually, the next perplexing question facing the legislators is the type of regulation to guarantee consumption. Thus far most legislators are agreed that "specification control" is the preferred arrangement, under which a fixed percentage of synthetic would be used in most products. But what percentage in which products must be determined and here industry itself is sharply divided. As one member of Congress has stated, there is a solution to the problem "but I wish someone would show us how to work it out."

CURRENT NEWS OF THE MONTH

INTERNATIONAL RUBBER GROUP HOLDS FOURTH MEETING IN PARIS

Under the chairmanship of Monsieur Georges Peter, Director of Economic Affairs at the Ministry of France Overseas, the fourth meeting of the International Rubber Study Group was held in Paris, France, from July 1 to 8. The principal objects of this latest meeting were to review the world rubber situation in the light of changes since the previous meeting, held at The Hague in November, 1946, and to consider the organization of an enlarged study group.

The meeting was attended by delegates from Australia, Belgium, Bolivia, Canada, Ceylon, Denmark, Ecuador, United States, France, Hungary, Italy, Liberia, Norway, Holland, United Kingdom, British Colonies, Siam, Czechoslovakia, and Venezuela. Also present were observers from Brazil, Colombia, Finland, Guatemala, Mexico, Poland, Portugal, Sweden, Switzerland. Special observers were sent by the United Nations Organization and the Food and Agriculture Organization.

According to an official statement released at the conclusion of the meeting, the study group adopted a resolution recommending that participating governments accept new terms of reference, the principal features of which are as follows:

(1) That membership shall be open to all countries substantially interested in the production, consumption of, or trade in, rubber.

(2) That the group shall consider measures designed to expand world consumption of rubber.

(3) That the group shall consider how best to deal with any special difficulties which may exist or may be expected to arise and may submit recommendations on the subject to the participating governments.

(4) That the group shall maintain such secretariat as it may deem necessary for the proper conduct of its work and shall arrange for the collection and dissemination of statistics.

Secretariat to Be Established

For the purpose of facilitating the establishment of a permanent secretariat, the study group has recommended unanimously to the participating governments the setting up as soon as possible of a management committee to supervise the establishment and work of the secretariat, the following members to be represented, in the first instance, on the management committees: France, Netherlands, United Kingdom and the United States. The question of the membership of the management committee will be reexamined at the next meeting. It was agreed that the permanent site of the secretariat should be in London.

The group examined the current statistical position but because of the many imponderables which now affect the situation refrained from making any firm estimates for supply and demand beyond the end of 1947. During 1947, as far as could be foreseen in present conditions, it was estimated that the production of natural rubber will be about 1,200,000 tons and of synthetic rubber about 515,000 tons. The total consumption of natural rubber is estimated at just over 1,060,000 tons and of synthetic rubber at 585,000 tons.

If these estimates are realized, stocks of natural rubber at the end of 1947 will be 140,000 tons higher than at the end of 1946, and stocks of synthetic rubber 70,000 tons lower. Both the United States and United Kingdom Governments are at present holding substantial stocks of natural rubber, and these should be taken into account in looking at the over-all stock position.

The Rubber Study Group noted with great concern the downward trend in the market price of natural rubber and decided to recommend that the governments concerned should consider, as a matter of urgency, what action they are in a position to take to meet this special difficulty.

The group considered what action could be taken to expand world consumption of rubber. They hoped that no avoidable obstacles would be placed in the way of international trade in and the use of rubber, and that maximum assistance should be given to the countries desiring to make an extensive use of rubber but which, on account of the war, cannot afford to pay in foreign currencies for the rubber imports they require.

Radioactive Crops

The Moscow radio said recently that Russian agriculturists had increased the yield of rubber plant and sugar beet harvests by the use of radioactive elements. Quoting Alexander Vinogradov, director of the Geochemistry Institute, the broadcaster said experiments had shown "radioactive elements raised the harvest yield, accelerated blossoming and ripening of plants and increased the carbohydrate content."

SYNTHETIC RUBBER LEGISLATION IS DEFERRED UNTIL NEXT YEAR

According to a statement issued by Representative Paul W. Shafer (Republican, Michigan), chairman of the House Armed Services Rubber Committee, all hope of permanent rubber legislation during the current session of Congress has been abandoned. Mr. Shafer emphasized the point, however, that such legislation would be presented to Congress soon after the first of next year.

In the interim, Mr. Shafer stated, the committee will hold hearings which will give industry spokesmen an opportunity to present their views. The hearings will be held in the Fall. In addition, the committee plans to make its own study of the synthetic rubber situation, supplementing its study with an on-the-spot investigation of the production of butadiene, styrene, copolymers, etc.

Mr. Shafer's statement, made on July 13, followed an earlier announcement by his committee that a report on permanent rubber legislation had been submitted to it by the Army-Navy Munitions Board, but that this report embodied views of governmental agencies only and not of industry representatives. The ANMB report was submitted in the form of a proposed bill and contained provisions, according to the House committee chairman, which industry "could not live with." The recommendations made by the Board were said to be very similar to those made by the now defunct Inter-Agency Rubber Policy Committee.

Consumption Is Moot Point

Although the House committee declined to reveal details of the proposed Munitions Board bill, it expressed the opinion that any bill which it would present to Congress must assure the consumption of a "rather substantial amount" of synthetic rubber. It furthermore indicated that any program proposed should be handled without the necessity of a Government bureau.

According to Mr. Shafer, the bill which the committee will eventually submit to Congress will involve the manufacture and compulsory consumption of a more-or-less specific amount of synthetic rubber, this amount representing "the minimum necessary to maintain a technically advanced and rapidly expandable industry."

It was also stated that the committee fully realized that the problem of synthetic rubber plant disposal, plus the possible creation of protected monopolies, must be fully analyzed and acceptable solutions offered.

NEW MICROSCOPE TECHNIQUE UNFOLDING ELASTICITY SECRET

A new microscope technique that is helping scientists to explain the secret of elasticity was reported on June 18 in a paper by Dr. E. A. Hauser, of the Massachusetts Institute of Technology, and Dr. D. S. le Beau, of the Midwest Rubber Reclaiming Co. The paper was given at the 21st National Colloid Symposium, sponsored by the Division of Colloid Chemistry of the American Chemical Society, held at Stanford University, Palo Alto, California.

According to the report, the ultramicroscope has succeeded where the electron microscope failed in revealing what changes take place in a material that is stretched. With an ultramicroscope it is possible to inspect enlarged and sharply defined shadows cast by tiny particles of rubber, too small to be visible under an ordinary microscope. Although greater magnification is possible with an electron microscope, the penetrating stream of high-speed electrons tends to "burn" the fibers under observation.

The ultramicroscope technique has offered definite proof that elasticity is not a property specific to a few substances, the paper declared, asserting that it is instead the result of a well-balanced proportion of fibrous molecules and liquid. Visual evidence has been provided that any elastic substance is a mixture of a liquid composed of very small molecules and a solid composed of relatively large, thread-like ones, the report continued, explaining:

"One can compare this condition to a snarl of wool soaked in water. If this is pulled so that the strands line up, the water is squeezed out. If rubber preparations are put under strain, the liquid component is also squeezed out, and collects in the form of small droplets on the stretched fibrous molecules."

Effects of Heat Studied

The formation of droplets is clearly visible with the ultramicroscope, and a heating device built into the instrument has made it possible to study the effects of heat upon elasticity, the report said. Results so far obtained have shown that elasticity depends upon heat and also upon the shape and size of the fibrous molecules.

"Even more important was the discovery that balata, chemically identical with natural rubber, will show the formation of droplets only if it is heated to the temperature at which it becomes elastic," the paper asserted. "This difference in the behavior of rubber and balata is the first visual evidence of how the configuration of a molecule can affect some physical properties of a substance.

"The next step was to ascertain if certain substances, which so far did not form droplets on prolonged storage or after a rise in temperature, would do so if different molecular weight fractions were mixed together.

"This was done with several non-elastic plastics. The new compound not only revealed the formation of droplets, but also had become elastic."

The ultramicroscopic technique opens up an entirely new approach to many problems with which science and technology have been confronted and has innumerable practical applications, the report declared.

Coming Events

Aug. 5. New York Rubber Group, Golf Tournament, Winged Foot Golf Club, Mamaroneck, N. Y.
Sept. 12. Chicago Rubber Group, Hotel Morrison, Chicago, Ill.
Sept. 17-19. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York City.
Sept. 27. Philadelphia Rubber Group, Philadelphia, Penna.
Sept. 27. Connecticut Rubber Group, Outing, Eichner's Grove, Trumbull, Conn.
Oct. 3. Boston Rubber Group, Hotel Somerset, Boston.
Oct. 7. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Calif.
Oct. 9. Southern Ohio Rubber Group, Outing, Gem City Club, Dayton, Ohio.
Oct. 24. New York Rubber Group, Hotel McAlpin, New York, N. Y.
Oct. 31. Chicago Rubber Group, Hotel Morrison, Chicago, Ill.
Dec. 5. Philadelphia Rubber Group, Philadelphia, Penna.
Dec. 12. New York Rubber Group, Xmas Party, Hotel McAlpin, New York, N. Y.
Dec. 12. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston.
Dec. 18. Southern Ohio Rubber Group, Dayton, Ohio.
Dec. 19. Chicago Rubber Group, Xmas Party, Hotel Morrison, Chicago, Ill.

Rubber Consumption in April

Consumption of rubber in April, 1947, increased slightly over the previous month, amounting to 98,784 long tons, according to the Rubber Manufacturers Association. This was an increase of .17% over the 98,618 tons consumed in March. Of the total amount of rubber consumed in April, 44,175 tons were natural rubber and 54,609 were synthetic. Consumption for the first four months of 1947 totaled 395,798 tons, as compared with 325,872 consumed during the corresponding period of the previous year, an increase of 21.46%. A total of 25,420 tons of reclaimed rubber was consumed in April, which is a decrease of 2.82% from the 26,157 tons consumed during the previous month.

MANUFACTURERS URGE LIFTING OF TIRE AND TUBE EXCISE TAX

Arguments supporting the elimination or moderation of the $159,000,000 Federal excise tax on tires and tubes were filed on June 12 with the Ways and Means Committee of the House of Representatives. The filing of briefs setting forth these appeals was announced by the Rubber Manufacturers Association. Compared to other automotive accessories, tires and tubes were said to bear taxes approaching those placed on luxury items.

The present wartime excise taxes on tires and tubes were labeled an onerous and unfair load on millions of farmers, production workers and truckers who use tires as tools in the production and transportation of such basic items as food, clothing and shelter. It was noted that the manufacturer's excise tax on tires ranges from 7 up to 14 percent of sales price in various categories.

Tax Out of Proportion

In a statement on behalf of the industry by J. J. Newman, vice-president of the B. F. Goodrich Company, Akron, it was pointed out that both tires and tubes bear an excise tax that is disproportionately higher than that levied against any comparable automotive parts and accessories. In seeking abatement of the tax, the industry also asked Congress to make provision for recovery of taxes on floor stocks in a manner to avoid disruption of warehousing, distribution and retailing facilities.

The industry identified as the bearers of this $159,000,000 excise tax load some "25 million motorists, the operators of nearly two million farm trucks and more than three million tractors, the owners of more than three million non-farm trucks and nearly a quarter of a million trailers, and the users of thousands upon thousands of motorcycles, tire-borne construction equipment, and other vehicles that ride on rubber tires."

By and large, the industry said, the operator of a light automobile gets off easiest, "paying only $7.15 in excise taxes when he buys new tires and tubes all the way around." Against this motorist stands the farmer who pays from $15 to $25 in excise taxes on tires and tubes for the usual type farm truck. Excise taxes on a single 15-28 6-ply tractor tire cost him $9.28.

Excise taxes on tires and tubes cost over-the-road trucks an estimated $28,000,000 in 1946 for replacement purposes alone, entirely apart from the excise taxes paid by this industry on original tire equipment purchased on new trucks, tractors and trailers. These expenses were said to represent an additional tax and a considerable tax on the transportation of goods, in addition to other taxes already levied upon such transportation. It constitutes, in effect, a special penalty against truck transportation, inasmuch as it does not apply equally to railway and other forms of transportation.

EIGHT PAPERS FEATURE A.S.T.M. SYMPOSIUM ON RUBBER TESTING

Approximately 150 members and guests attended the "Symposium on Rubber Testing," held under the auspices of A.S.T.M. Committee D-11 on Rubber and Rubber-Like Materials, at the Haddon Hall Hotel in Atlantic City, N. J., on June 19th, in conjunction with the 50th Annual Meeting of the American Society for Testing Materials. The meeting itself focused attention on a number of important activities involving standardization and research in materials. Total registered attendance was 1781.

T. A. Boyd, head of the Fuel Department, Research Laboratories Division, General Motors Corp., Detroit, Mich., was elected president for 1947-48, succeeding Arthur W. Carpenter of the B. F. Goodrich Co. J. G. Morrow, metallurgical engineer, Steel Company of Canada, Ltd., Hamilton, Ontario, was elected vice-president.

The "Symposium on Rubber Testing," which covered some of the work done with regard to the physical and chemical methods of test, both on natural and synthetic rubber, during the wartime period, featured the presentation of eight papers. Simon Collier (Johns-Manville), chairman of Committee D-11, and Harry E. Outcault (St. Joseph Lead) served as co-chairmen for the symposium.

Carpenter Delivers First Paper

Mr. Carpenter, the retiring chairman of the Society, who also acts as secretary of Committee D-11, presented the first paper in the symposium. Taking as his subject "The Significance of Voluntary Standards and Their Status in the Rubber Industry," Mr. Carpenter briefly reviewed progress in standardization of methods of test and specifications in the rubber industry prior to World War II, stressing the contributions of Committee D-11 from the time of its formation. He also reviewed standardization work accomplished during the wartime period under government direction. In concluding his talk, Mr. Carpenter outlined the position of A.S.T.M. in the postwar standardization program.

The historical background of the American synthetic rubber program was outlined in a paper on "Function of Rubber Reserve, Past, Present and Future," by W. R. Hucks, of the Office of Rubber Reserve. Mr. Hucks also discussed the work of Rubber Reserve with various segments of the rubber industry to establish standardized products and standard testing procedures. He also furnished details of the laboratory safety program carried out by Rubber Reserve and concluded his talk with some details of projected future programs.

A paper on "Development of Methods of Chemical Analysis of Synthetic Rubber," by Willard P. Tyler, of the B. F. Goodrich Co., and T. Higuchi, of the Government Evaluation Laboratory, was presented by Mr. Tyler. This paper traced the development of chemical methods of testing synthetic rubber during recent years and discussed the present status of the methods. Mr. Tyler placed particular emphasis on control and specification methods for testing GR-S, as well as other synthetics, and reviewed some of the methods for the identification and determination of synthetic rubbers and compounding ingredients in vulcanized rubber compounds.

"Developments and Improvements in Methods of Stress-Strain Testing" was the title of a paper prepared by J. W. Schade, of the Government Evaluation Laboratory, and F. L. Roth, of the National Bureau of Standards, delivered by Mr. Roth. The paper covered the modifications of A.S.T.M. Methods D-15-41 and D-412-41 for stress-strain testing which have been incorporated in the current specification for GR-S. Improvements in and standardization of stress-strain testing procedures, it was stated, have resulted in the elimination of more than 60% of the variability in testing existing among 16 laboratories in 1944. Mr. Roth also outlined a new method and machine for stress-strain testing which is based on measurements of elongation at constant stress.

Evaluation of Processibility

Rolla H. Taylor, of the National Bureau of Standards, J. H. Fielding, of the Goodyear Tire & Rubber Co., and M. Mooney, of the U. S. Rubber Co., were the authors of a paper on "Development and Standardization of Tests for Evaluating Processibility." Delivered by Mr. Taylor, this paper outlined the steps taken to adapt the Mooney viscometer as a control in the manufacture of GR-S. It also discussed processibility indices in terms of banding time, mill breakdown, Mooney viscosities, shrinkage and rugosity. The behavior on a laboratory tubing machine and a factory method of evaluation were also discussed.

How the present uniformity of synthetic rubber production was achieved was the subject of a paper on "Standardization of Testing and Inspection in Government Synthetic Rubber Plants" by Ludwig Meuser, of the U. S. Rubber Co., Robert D. Stiehler, of the National Bureau of Standards, and R. W. Hackett, of the Office of Rubber Reserve, delivered by Mr. Meuser. According to Mr. Meuser, the point has been reached where the precision of testing is about as good as present methods will permit and further significant improvements in uniformity of production must await the introduction of improved test methods.

A new method for the testing and evaluation of wild rubber was suggested by Norman Bekkedahl, of the National Bureau of Standards, in a paper on "Testing and Grading of Wild and Plantation Rubbers." The method in its present form is not suitable for application to the grading of plantation rubber, but Mr. Bekkedahl suggested that certain of the tests and specifications be included in a general method whereby all types of natural rubber can be purchased on the basis of laboratory tests rather than solely by the results of the present-day system of superficial examination.

The final paper, entitled "The Use of Statistical Methods in Rubber Evaluation," was given by Marian M. Sandomire, of the Bureau of Ships of the Navy Department. In this paper Miss Sandomire discussed the use of statistical methods in their application to many phases of rubber evaluation, such as in the control of quality of manufactured products, the writing of specifications containing sampling inspection plans, the use of inspection test data, and the development of test methods. She illustrated many problems connected with rubber work in which these methods made a contribution.

Rubber Union Outlines Position

Following a meeting of the CIO executive board held in Washington late last month, officials of the United Rubber Workers of America indicated that the rubber union would inform the rubber industry that despite the recently-enacted Taft-Hartley Act the union intends to abide by its present contracts with management. They warned, however, that any attempts by employers to use the new labor legislation to frustrate bargaining obligations would be met with strong union opposition. Union officials also indicated they planned to seek early meetings with managements to discuss the new labor law in an effort to reach mutual understanding on interpretations of its provisions.

Thermoid Plans Stock Exchange

In order to acquire voting control of the Asbestos Manufacturing Co., Huntington, Indiana, the Thermoid Co., Trenton, N. J., is preparing to offer common stock in exchange for the common and preferred stock of Asbestos. Terms of the exchange would give two shares of Thermoid common for each preferred share of Asbestos, and one share of Thermoid common for each four shares of Asbestos common. Thermoid, which presently owns about 25% of the Asbestos common stock, has agreed to provide additional working capital for Asbestos, providing Thermoid obtains voting control of Asbestos under the proposed stock exchange offer.

To Rebuild Texas City Plant

Reconstruction of part of its plant in Texas City, Texas, which was destroyed by the disaster of April 16, has been launched by the Monsanto Chemical Co. The initial reconstruction of the plant is expected to cost approximately $6,000,000, with $1,000,000 going for rebuilding and $5,000,000 for mechanical installations with process equipment. The rebuilding of the remainder of the plant will be started when this work is substantially completed and the plant is again in operation.

ASME RUBBER-PLASTICS GROUP HOLDS MEETING IN CHICAGO

A meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers was held at the Stevens Hotel in Chicago, Ill., on June 19, in conjunction with the semi-annual meeting of the parent society. The A.S.M.E. meeting itself was held from June 15 through 19, and featured technical sessions held by various divisions. E. G. Bailey, vice-president of the Babcock & Wilcox Co., was elected president of the society for the 1947-48 season.

The meeting of the Rubber and Plastics Division featured the presentation of three papers (discussed below). The only other activity of the Division was a joint meeting held by the General, Advisory and Executive Committees to plan programs and future national meetings.

In a paper on "Buick Motor Mount Testing Machine," Lloyd E. Muller, staff engineer, Acoustical and Vibration Department, Buick Motor Division, General Motors Corp., Flint, Mich., pointed out that in any vibration control problem two factors are available to work with, namely, frequency and damping. Referring to the use of spring and shock absorbers in obtaining fine ride characteristics in modern vehicles, he briefly discussed the preventing of road roughness and the approach used in preventing engine roughness from disturbing the occupants of automobiles.

Referring to the mounting of engines on rubber springs or mountings as the frequency approach of reducing the transmission of engine roughness, Mr. Muller stated that a practical method of damping the engine's amplitude of motion became available with the commercial production of synthetic rubber of the high hysteresis type. This new factor, however, presented the problem of measurement and control, and with this in mind the Buick Motor Mount Testing Machine was developed. The elements making up this machine, which records hysteresis and the rate of actual mounts under dynamic conditions, were described in detail, as was the method of operation.

Performance of Hydraulic Packings

LaVerne E. Cheyney and T. J. McCuistion, both of the Rubber Laboratory, Battelle Memorial Institute, Columbus 1, Ohio, presented a paper on "Factors Influencing Performance of Aircraft Hydraulic Packings." This paper related that, basically, hydraulic systems are composed of a combination of certain solids, a fluid, and packing or sealing glands, which are intermediate in properties between solid and fluid.

Rubber, commonly employed in hydraulic systems, has properties of both solids and fluids. The true solids in the system are represented by a variety of alloys which are fabricated into various structures such as pistons, pumps, cylinders, etc. The fluid is normally a low viscosity lubricating liquid which has as nearly as possible a relatively level viscosity-index curve, in order to facilitate operation of the system over a wide range of temperatures.

The sealing or packing materials currently used are the typical oil-resistant types of synthetic rubber. These rubbers tend to flow in a manner similar to fluids under extremely high pressures, such as those found in hydraulic systems, but they exert considerable resistance to such flow at the same time. The paper discussed the effect of packing design, diametral clearance, metal finish, corrosion of metal, operating pressure, temperature and other factors in which the design engineer is vitally interested.

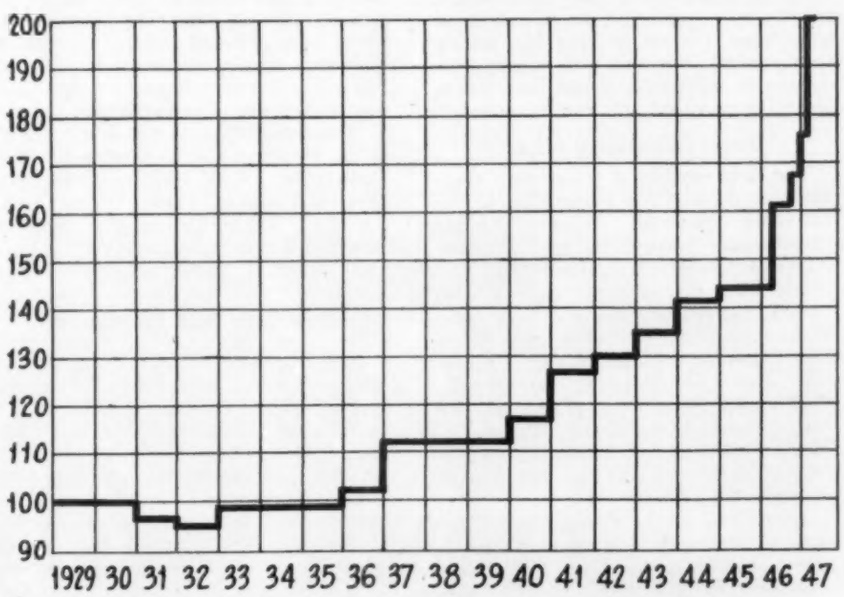
The third and final paper was "Some Properties and Mechanical Applications of Compar," by J. J. Hitov, molding engineer, Resistoflex Corp., Belleville 9, N. J. Mr. Hitov presented data showing the complete resistance of the compars, the generic name used to designate a line of compounded, modified polyvinyl alcohol resins, to aliphatic and aromatic hydrocarbons and their chlorinated derivatives. He compared the effect of carbon tetrachloride on the swell and durometer characteristics to several synthetic rubbers. Data on tensile strength, before and after immersion in organic solvents, was also presented.

Stress-strain relationships for five standard compars were graphically portrayed, showing the tensile strengths to vary from 1000 psi for the softest (50 durometer) to 4000 to 5000 for the 95 durometer stock. All compars discussed have elongations around 500%. The speaker also presented data indicating that compar is superior in abrasion resistance to the polychloroprenes and alkylpolysulfides. The effect of aging on dimensional stability, tensile strength, hardness, and low temperature flexibility was also covered.

Organize New Testing Bureau

An independent agency for sampling, testing, and certifying of materials and products to aid consumer, distributor and producer has been organized as the American Standards Testing Bureau, Inc., 44 Trinity Place, New York 6, N. Y. The new concern was organized to permit expansion of the testing and quality control services formerly rendered by Sam Tour & Co., Inc. The company advises that it has facilities for testing of rubber products or compounded samples in accordance with almost all of the A.S.T.M., Federal, Army, Navy, etc., specifications, and can also perform service tests on coated fabrics, tapes, wire, etc. In addition, the staff of the new testing agency has had considerable experience in the development of rubber compounds for use as flexible molds in the jewelry industry.

CHART DEPICTS INCREASE IN RUBBER MACHINERY AND EQUIPMENT COSTS



The above chart, prepared by the Factory Mutual Appraisal Division of the Associated Factory Mutual Fire Insurance Companies, 184 High St., Boston 10, Mass., is based on a representative schedule of machinery and equipment in a typical rubber plant. The year 1929 is taken as a basis, and the values are adjusted for succeeding years to compensate for difference in performance compared with improved models. Specific plants may vary somewhat from the chart, but it represents a good average picture of fluctuations for the period. The chart applies to the United States only. It is copyrighted by the Associated Factory Mutual Fire Insurance Companies and may not be used without permission.

AKRON RUBBER GROUP OUTING FEATURES GOLF TOURNAMENT

The Akron Rubber Group held its annual summer outing on June 20, with approximately 215 members and guests participating in a golf tournament in the afternoon at the Turkeyfoot Golf Club and about 541 members and guests attending the dinner and prize drawing in the evening at Sandy Beach Park. Frank M. Andrews (Phillips Petroleum) served as chairman of the Outing Committee, assisted by Henry F. Palmer, Vernon K. Hitch (Akron Chemical), Mason Kirkland (Russell Farley & Co.), Roy H. Marston, Jr. (Binney & Smith), and James F. Hand (Monsanto).

Golf Tournament Winners

Winners of the golf tournament were: *Long Drive,* M. J. Rhoad, 268 yards; *Short Drive,* W. B. Thompson, 4 inches; *Low Gross,* John Cseh, 72; *High Gross,* F. J. Naples, 155; *Accuracy on No. 9,* E. A. Frank. Nineteen participants won blind bogey prizes for shooting nets of 74 and 79.

In addition to the normal hazards encountered by the golfers, the Golfing Committee provided several of their own. On the first tee the shooters were required to tee-off while standing in a wash tub, and holing out on the last green was made somewhat uncertain by heckling through a public address system.

After the dinner at Sandy Beach Park, more than 260 door prizes, totaling nearly $2,500 in value, were awarded to lucky ticket holders. Some of the most outstanding prizes were $50 merchandise awards, sets of matched woods and irons, a portable outdoor broiling kit, and a steel shafted iron golf club having two detachable, adjustable heads with which an entire round of golf can be played.

Firms Contributing Prizes

The large number of prizes were made available through the cooperation of the following concerns: Adamson United Co., Advance Solvents & Chemical Corp., Akron Chemical Co., Akron Gear and Engineering Co., Akron Standard Mold Co., L. Albert & Son Co., Aluminum Flake Co., American Anode, Inc., American Cyanamid & Chemical Corp., American Zinc Sales Co., Armour & Co., American Viscose Co., Barnsdall Oil Co., Barrett, Biggs Boiler Works Co., Binney & Smith Co., Stewart Bolling & Co., Bridgeport Brass Co., Bridgewater Machine Co., Brown Co.

Also Godfrey L. Cabot, Inc., Caldwell Co., Carbide & Carbon Chemicals Corp., Philip Carey Mfg. Co., Carter Bell Mfg. Co., Celanese Chemical Corp., Central Rubber & Steel Corp., Cleveland Liner & Mfg. Co., Columbia Chemicals, Commercial Solvents Corp., Continental Carbon Corp., Curran & Barry, E. W. Colledge, Inc., Poncet Davis Co., T. A. Desmond & Co., Diamond Alkali Co., Dill Mfg. Co., Dow Chemical Co., Dow Corning Corp., E. F. Drew & Co., E. I. du Pont de Nemours & Co.

Also Eastern Magnesia Talc Co., Electro-Technical Products, Inc., Emery Industries, Inc., English Mica Co., Enjay Co., Farley, Russell & Co., Farrel-Birmingham Co., Fuller Associates, General Chemical Co., General Latex & Chemical Corp., B. F. Goodrich Chemical Co., Goodyear Tire & Rubber Co., Glidden Co., C. P. Hall Co., Hardesty Chemical Co., Harwick Standard Chemical Co., Herron Bros. & Meyer, Imperial Paper & Color Corp., *India Rubber World,* Industrial Rayon Corp., Innis, Speiden & Co., Charles Eneu Johnson & Co., J. A. Kendall & Co., E. P. Lambert Co.

Also Mansfield Paint Co., Marathon Corp., C. F. Marshall & Co., McNeil Machine & Engineering Co., Miami Boiler & Machine Co., Midwest Rubber Reclaiming Co., Monsanto Chemical Co., Mt. Vernon-Woodberry Mills, H. Muehlstein & Co., F. F. Meyers Co., M. F. Murdock Co., Manufacturers Rubber & Supply Co., National Lead Co., National Rubber Machinery Co., National Standard Co., Naugatuck Chemical, Neville Co., New Jersey Zinc Sales Co., Karl W. V. Nix Co., Ohio-Apex, Inc., Parr Paint & Color Co., Pennsylvania Industrial Chemical Corp., Pequanoc Rubber Co., Phillips Petroleum Co., Pittsburgh Coke & Iron Co.

Also Rex-Hide, Inc., Richmond Mica Corp., B. W. Rogers Co., RUBBER AGE, A. Schulman, Inc., Scott Testers, Inc., A. Schrader's Son, Sharples Chemicals, Inc., V. L. Smithers, Inc., Southern Acid & Sulfur Co., Stamford Rubber Supply Co., Standard Oil Co. of Ohio, Standard Oil Co. of Indiana, Stauffer Chemical Co., St. Joseph Lead Co., Stoller Chemical Co., Sun Oil Co., Synthetic Products Co., Scovill Mfg. Co., Tanney-Costello, Inc., Thiokol Corp., Thompson Weinman & Co., William R. Thropp Sons Co., Titanium Pigment Corp., Turner Halsey Co., United Carbon Co., R. T. Vanderbilt Co., White & Co., J. J. White Products Co., Whittaker Clark & Daniels, Inc., C. K. Williams Co., Wilmington Chemical Corp., Witco Chemical Co., Xylos Rubber Co., Yale & Towne Co.

New York Golf Tournament

Jean H. Nesbit, of the U. S. Rubber Reclaiming Co., 500 Fifth Ave., New York 18, N. Y., has announced that those who wish to attend the golf tournament of the New York Rubber Group on August 5 at the Winged Foot Golf Club in Mamaroneck, N. Y., should mail reservations to him promptly. The greens fee for the tournament is $5, while lunch is $2 or may be ordered a la carte, and dinner is $4.50. Prizes in the golf tourney will be awarded to first and second low gross, first and second low net, and the three winners of the kicker's handicap. Members of the golf committee, which is headed by Mr. Nesbit, include D. E. Jones (American Hard Rubber), D. F. Cranor (Binney & Smith), and E. B. Curtis (Vanderbilt).

OUTING OF RHODE ISLAND CLUB FEATURED BY GOLF TOURNAMENT

An interesting golf tournament, with prizes to the winners of various events, featured the annual summer outing of the Rhode Island Rubber Club, held on Thursday, June 19, at the Pawtucket Golf Club in Pawtucket, R. I. A record crowd of approximately 115 members and guests attended the summer outing, with about 40 participating in the golf tourney.

The golf tournament, which was scheduled to start at 1:30 p.m., did not get under way until 3 p.m. because of a heavy downpour. H. W. Kugler captured the kicker's handicap, while William Maguire won low gross with 75 and William Newman was runner-up with 77. In addition to the usual prizes to the winners of the golf tournament, gifts were also distributed to every member and guest present at the outing.

Companies contributing to the list of prizes follow: Akron Standard Mold Co., American Cyanamid & Chemical Corp., American Zinc Sales Co., Barrett Division, Binney & Smith Co., Brockton Cutting Die & Machine Co., Bunatak Chemical Co., Godfrey L. Cabot, Inc., Cleveland Liner & Mfg. Co., Columbia Chemical, E. I. du Pont de Nemours & Co., William D. Egleston Co., Enjay Co., Inc., Farrel-Birmingham Co., B. F. Goodrich Chemical Co., C. P. Hall Co., Harwick Standard Chemical Co., Howe & French, Inc., J. M. Huber Corp., Imperial Paper & Color Corp., Ernest Jacoby & Co.

Also John D. Lewis, Meyer & Brown Corp., Monsanto Chemical Co., H. Muehlstein & Co., Naugatuck Chemical, Neville Co., New Jersey Zinc Sales Co., Oakite Products, Pequanoc Rubber Co., Philipp Bros., Inc., Phillips Petroleum Co., Scott Testers, Inc., A. Schulman, Inc., Stamford Rubber Supply Co., Stanley Chemical Co., Stauffer Chemical Co., Sun Oil Co., Thiokol Corp., Titanium Pigment Corp., United Carbon Co., R. T. Vanderbilt Co., Vansul & Co., L. G. Whittemore, C. K. Williams & Co., Witco Chemical Co.

California Group Hears Garland

C. F. Garland, associate professor at the University of California at Berkeley, California, was the principal speaker at the May meeting of the Northern California Rubber Group, held at Angelo's Restaurant in Emeryville, California, on May 22. Mr. Garland gave an interesting talk on "The Mechanical Features of Rubber for Vibration Dampeners and Shock Absorbers."

A technical report (No. 47-3) on the company's non-discoloring agent for rubber sponge, known as Unicel ND, has been made available by DuPont.

After a period of nearly six years, Goodyear has resumed production of white sidewall tires for bicycles in all balloon sizes.

BOSTON RUBBER GROUP HOLDS SUMMER OUTING ON JUNE 27

Approximately 425 members and guests attended the dinner and participated in the golf tournament and other field events at the annual summer outing of the Boston Rubber Group, held at the Woodland Golf Club in Newton, Mass., on June 27. Arrangements for the outing were in the hands of Owen J. Brown, Jr., general sales manager of Godfrey L. Cabot, Inc., who was ably assisted by Harry W. Sutton and Harry A. Atwater.

In the golf tournament seven winners were selected for the kicker's handicap. They were W. B. Richardson, R. Varnum, J. Breckley, A. Sherry, C. Hamilton, R. Edwards, and J. E. Hart. Other winners of the golf tournament follow: *Low Gross,* J. Bernard, H. Brainbridge, J. Clapp, A. Clapp, and C. Davidson; *Low Net,* J. Upham, J. Cameron, H. Bremner, and L. Ervin; *Nearest Pin,* J. C. McKay and A. B. Harding; *Longest Drive;* J. N. Manning; *Most 4's,* W. A. Maguire; *Most 7's,* F. D. Bean.

In addition to the golf tournament, four other field events were held during the day, including a softball contest which was won by T. C. Ashley's "Bearcats." Dart throwing honors went to William DeWolf, while W. E. Walker and John Ball were victorious in the tennis tournament, and A. E. Baker and C. E. Wilson captured the horseshoe pitching contest.

A surprisingly large number of prizes were made available through the cooperation of the following concerns: Advance Solvents & Chemical Corp., Aluminum Flake Co., American Cyanamid & Chemical Corp., American Mineral Spirits Co., American Zinc Sales Co., Anderson-Pritchard Oil Corp., Angier Products, Inc., Archer Rubber Co., T. C. Ashley & Co., Avon Sole Co., B. B. Chemical Co., Bakelite Corp., J. T. Baker Chemical Co., Barrett, Binney & Smith Co., Stewart Bolling & Co., Boston Woven Hose & Rubber Co., Brockton Machine Co., Brooklyn Color Works, Bunatak Chemical Co., H. W. Butterworth & Sons Co.

Also Godfrey L. Cabot, Inc., Calco Chemical, Caldwell Co., Callaway Mills Co., Cambridge Rubber Co., Carbide and Carbon Chemicals Corp., Carter Bell Mfg. Co., J. F. Carter Co., Chemical & Pigment Co., C. F. Church Mfg. Co., Cleveland Liner and Mfg. Co., Converse Rubber Co., Colloids, Inc., Colonial Beacon Oil Co., James B. Cunningham Co., Deecy Products Co., Delco Rubber Corp., Dow Chemical Co., E. F. Drew & Co., Inc., E. I. du Pont de Nemours & Co., W. D. Egleston Co., Emery Industries, Inc., Enjay Co., Erie Engine & Mfg. Co.

Also General Atlas Carbon Co., General Dyestuffs Corp., General Latex & Chemical Corp., Givaudan-Delawanna, Inc., B. F. Goodrich Chemical Co., Gulf Oil Corp., Haartz-Mason, Inc., Alfred Hale Rubber Co., C. P. Hall Co., Hercules Powder Co., Herron Bros. & Meyer, Heveatex Corp., Hird & Connor, Hodgman Rubber Co., Hood Rubber Co., J. M. Huber Corp., Ralph B. Huber, Downer Hunnewell Co., Imperial Paper & Color Corp., *India Rubber World,* Innis, Speiden & Co., Intercontinental Rubber Co., Ernest Jacoby & Co., Keystone Lubricating Co., King & Lang, Inc., D. H. Litter Co.

Also Malrex Chemical Co., Midwest Rubber Reclaiming Co., Monsanto Chemical Co., H. Muehlstein & Co., National Sherardizing & Machine Co., Naugatuck Chemical, Neville Co., New Jersey Zinc Sales Co., A. C. Nispel, Inc., Oakite Products, Inc., Pacific Mills, Inc., Panther-Panco Rubber Co., Pennsylvania Industrial Chemical Corp., Pequanoc Rubber Co., Philipp Bros., Inc., Phillips Petroleum Co., Pittsburgh Plate Glass Co., Plymouth Rubber Co., Pratt & Lambert, Inc., Gladding Price, Quabaug Rubber Co., Raffi & Swanson, Inc., Raw Materials Co., R. B. H. Dispersions, Inc., Reichhold Chemicals, Inc., Rosenfield Printing Co., RUBBER AGE.

Also A. Schrader's Son, A. Schulman, Inc., Scott Testers, Inc., Sessions-Gifford Co., Sharples Chemicals, Inc., Shell Oil Co., Simplex Wire & Cable Co., Socony Vacuum Oil Co., Stamford Rubber Supply Co., Standard Ultramarine Co., Stanley Chemical Co., Stauffer Chemical Co., Stedfast Rubber Co., Stowe-Woodward, Inc., Sun Oil Co.

Also C. J. Tagliabue Mfg. Co., Taylor Instrument Cos., Textile Proofers, Inc., Thiokol Corp., William R. Thropp & Sons, Tillotson Rubber Co., Titanium Pigment Corp., A. J. Tower Co., Tyer Rubber Co., Union Bay State Chemical Co., United Carbon Co., U. S. Rubber Reclaiming Co., Vansul & Co., Warwick Chemical Co., Weller Chemical Co., Whittaker, Clark & Daniels, Inc., L. G. Whittemore Co., C. K. Williams & Co., Wilmington Chemical Co., Charles T. Wilson Co., Windram Mfg. Co., Witco Chemical Co., Woburn Degreasing Co., Xylos Rubber Co.

FIRST POST-WAR SUMMER OUTING HELD BY DETROIT RUBBER GROUP

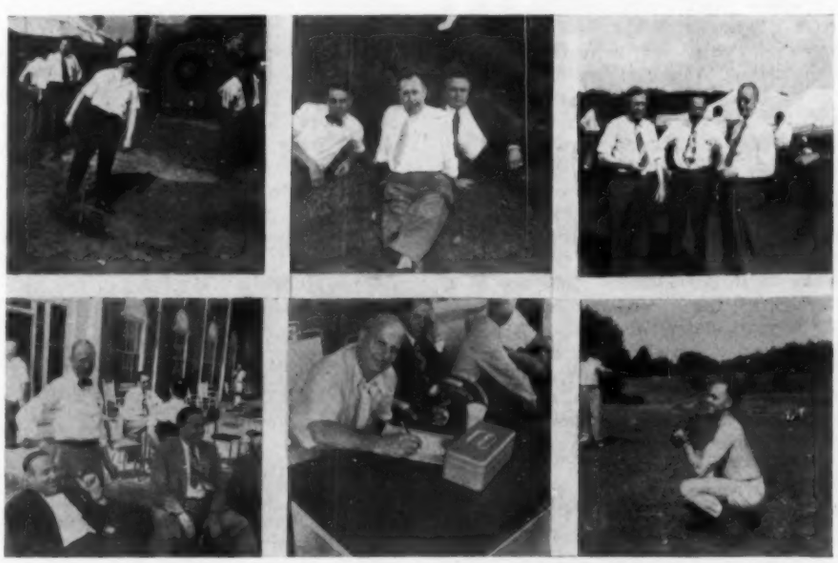
The first summer outing since before the war was held by the Detroit Rubber & Plastics Group at the Forest Lake Country Club in Pontiac, Mich., on June 27. Approximately 160 members and guests attended the outing, which featured an interesting golf tournament, with prizes to the winners of various events.

R. Hannon (Minnesota Mining) won first prize for low score in the golf tournament, while Albert Korejwa (Wyandotte Chemicals) made high score. In the kicker's handicap, six names were drawn from a group of twenty-five having a net score between 70 and 80. The winners were: A. Schosberger (Kaiser-Frazer), P. Stout (Oakland Machine), J. Swint (Firestone), J. Snyder (Binney & Smith), P. H. Smith (Firestone), and F. L. Kilbourne (Xylos Rubber).

Door prizes were awarded to R. C. Lilly (General Motors), Stan Baxter (Allen Industries), S. Linder (Minnesota Mining), Edward Hindle (U. S. Rubber), P. H. Smith (Firestone), and V. Root (Johnson Rubber). Arrangements for the outing were in the hands of Tom Halloran and George Horsfull, who were ably assisted by Edward Kvet, secretary-treasurer of the Group, J. P. Wilson and William Davies.

Abbey Appointed Group Treasurer

W. F. Abbey, of the Firestone Tire & Rubber Co., Pottstown, Penna., has been appointed treasurer of the Philadelphia Rubber Group in addition to his duties as secretary of the Group. His appointment became necessary when T. T. MacConnell, of the U. S. Rubber Reclaiming Co., 500 Fifth Ave., New York 18, N. Y., resigned as treasurer of the group.



View of some of the activities at the summer outing of the Boston Rubber Group.

CHANGES IN PERSONNEL REPORTED BY DUPONT RUBBER CHEMICALS DIVISION

Expanding activities of the DuPont Rubber Chemicals Division have led to several changes and additions in personnel in the Wilmington, Del., office, in the laboratories, in branch offices, and in the export section. The changes are intended to broaden the Division's research and technical service and to supplement sales staffs. The following men have joined the Division:

Harry McCollum is working with the tire compounding group at the DuPont Rubber Laboratory, Deepwater Point, N. J. He spent several years with the Firestone Tire & Rubber Company, first in the Akron headquarters, then became chief chemist in the Bombay, India, plant, returning to Akron several years later. He joined DuPont in May of this year. Mr. McCollum received his B.S. degree in chemistry from Cornell University in 1939.

Richard W. Malcolmson has recently joined the Wilmington office where he will be engaged in sales promotion. Upon graduation from Columbia University, he was employed by Goodyear Tire & Rubber Company, where he worked in the compounding of a varied line of mechanical goods.

Joseph Fuller is a member of the Rubber Laboratory staff at the Chambers Works, Deepwater Point. He is specializing in wire and cable compounding. He came to DuPont on Nov. 18, 1946, from the General Cable Corporation, where he had been employed in their Rome, N. Y., plant since 1940.

The following major shifts in personnel have been announced:

Americus Woodward has been transferred from the Ponsol Color Laboratory at the Chambers Works to the Rubber Laboratory where he will specialize in latex compounding and service work.

Wallace MacKinnon, who has been a tire compounder at the Rubber Laboratory for the past two years, has been transferred to the Wilmington office where he is engaged in sales analysis and market research. On getting his B.S. degree in chemistry from the University of Akron in 1924, he became a chemist for the Racine Horseshoe Tire Company, in Racine, Wis. In July, 1926, he joined the Miller Rubber Company as an analytical chemist, a year later going to B. F. Goodrich Company as a member of the tire compounding group. Two years later he became factory-laboratory liaison chemist for the Kelly-Springfield Tire Company. In July, 1935, he became development compounder and plant chief chemist for the Armstrong Cork Company, moving to the Acushnet Process Company in October, 1943, where he served as factory control chemist until he joined DuPont on September 17, 1945.

Dr. Russell Kurtz has been assigned to sales work in the New Jersey, Pennsylvania and Maryland area. He became a chemist at the Jackson Laboratory on obtaining his Ph.D. from Notre Dame University in 1942. He was transferred to the Rubber Laboratory on May 1, 1946, as a research chemist .

W. H. Ayscue, who is well known in the eastern territory, has been transferred to the Akron office to handle a number of important accounts throughout the Ohio and middle west area. He joined DuPont as a chemist in the Rubber Laboratory after receiving his master's degree in chemical engineering from North Carolina State in 1935. He went into sales work in 1943.

Paul Hartsfield has been transferred from the Rubber Laboratory at Deepwater Point to the Akron Laboratory. He will continue his work on latex compounding. He has been connected with DuPont since October 10, 1940, when he joined the staff at Jackson Laboratory. He went to the control laboratory of the Fine Chemicals Division on his return to DuPont from several years in war plants, being transferred to the Rubber Laboratory on October 1, 1945.

Among the changes in the Export Section are:

Pieter Ottenhoff, rubber technologist, who sailed May 14 with his family to take up residence in Europe. He will travel extensively providing technical service to users of neoprene and rubber chemicals. He was born in Java, but received his technical education in The Netherlands. He joined the Sugar Factory at Halfweg in The Netherlands on obtaining his chemical engineering degree from the technical school at Delft, Holland. He became a member of the DuPont staff in The Hague in 1936 as a rubber technologist, and worked in the European field until war broke out when he joined the Rubber Laboratory staff, January 2, 1941.

Emanuel S. Voutetakis, who left on June 21 for a five months' visit to rubber companies in Europe. He joined the Industrial Tape Corporation in New Brunswick, New Jersey, in 1943 on graduation from Rutgers University with a B.S. degree in chemistry. From April, 1944, to October, 1946, he was an officer in the U. S. Navy, serving as a member of the Allied Control Commission in Bulgaria. He came to DuPont on his release from the Navy, to join the Rubber Chemicals sales force.

Robert DePuy, who has been transferred from the Rubber Laboratory to Wilmington for technical sales work. Although born in Brooklyn, he lived for 13 years in Germany and Italy, returning to the United States for preparatory schooling. He joined the Goodyear Tire & Rubber Co. for mechanical goods development on his graduation from Purdue University in 1942, with a B.S. degree in chemical engineering. He came to DuPont in November, 1946.

Demonstrate "Rubber-Hipped" Bus

Jointly sponsored by the Twin Coach Co. of Kent, Ohio, and the B. F. Goodrich Co., Akron, a "rubber-hipped," six-legged bus, 12 feet longer than the longest urban bus now in use and yet able to make a considerably sharper turn, was demonstrated to transit officials and others in New York City on June 24. Outstanding features of the new bus are its ability to maneuver in city streets with no more turning room than a conventional 32-seat model, and the softness of the ride achieved by the "rubber-in-twist" springs. These are the Torsilastic springs developed by Goodrich. They serve to eliminate completely any metal-to-metal transmission of road shocks from pavement to vehicle. The bus is articulated at its mid-section, so that it can bend up and down to accommodate itself easily to rolls and dips in the road. The hinge is a special type of Torsilastic spring. The top and side of the bus at this point have a special rubber diaphragm designed to expand and contract while the vehicle dips and climbs.

History of Whitney Blake Co.

Under the title of "The Whitney Blake Story," the history of the Whitney Blake Co. is told in the June 15, 1947, issue of *The Royle Forum,* popular house organ of John Royle & Sons, Paterson 3, N. J. The story covers the history of the company from the time of its organization in 1899 as the Goodyear Rubber Insulating Co. in New York City through its present operations at Hamden, Conn. The history of Whitney Blake parallels the growth and development of rubber insulated wire.

Two New Niagara Chemicals

Niagara Alkali Co., 60 East 42nd St., New York 17, N. Y., recently introduced two new chemicals—Niagathal A (tetrachloro phthalic acid hydrate) and Niagathal W (tetrachloro phthalic anhydride, approximately 50% chlorine). Niagathal W finds widespread application in dyes and intermediates, and is used in insulating materials, plasticizers, protective coatings, etc. Niagathal A is said to react more readily with alcohols and bases and to show greater solubility in some organic solvents.

Titanium Trust Verdict Upheld

Charges of violation of the Sherman Anti-Trust Act in the control of titanium compounds were upheld by the United States Supreme Court on June 23 against E. I. du Pont de Nemours & Co., Inc., the National Lead Co., Inc., and the Titan Co., Inc. The court's findings sustained rulings of the Southern District Court of New York, which found that the companies had combined to restrain foreign and domestic trade in titanium compounds.

UNIVERSITY OF AKRON SPONSORS AKRON POLYMER LECTURE GROUP

The Akron Polymer Lecture Group has been organized under the auspices of the University of Akron to promote the discussion of recent fundamental advances in high polymer science. The Group plans to accomplish this objective by means of a subscription series of lectures and discussions covering a wide variety of subjects, including organic chemistry, physical chemistry, and physics of high polymers, each to be presented by an authority in the field.

The subscription fee for the Group has been set tentatively at $7 for a series of seven meetings. However, according to the Group, this number will depend upon the support given to the project by the research workers in the Akron area.

Officers of the group for the coming year include: *Chairman,* Dr. Paul J. Flory (Goodyear); *Vice-Chairman,* Dr. G. S. Whitby (University of Akron); *Treasurer,* Dr. C. F. Gibbs (Goodrich); and *Secretary,* Dr. R. J. Reid (Firestone).

The inaugural meeting of the Group was held at the University of Akron on June 9, with Dr. E. H. Farmer, of the British Rubber Producers Association, as the principal speaker. Dr. Farmer spoke on "Certain Recent Chemical Concepts Relating to Rubber."

In his talk, Dr. Farmer reviewed the theories which he had derived from the reaction of various ingredients with low molecular weight mono- and polyolefin molecules. He divided the reactions into the two fundamental concepts of displacement of hydrogen from an alpha-methylene carbon and the addition of reagent to carbon-carbon double bonds, considering reactions of polar and radical types. He discussed in detail the peroxide catalyzed polymerization of ethyl linoleate, the photo-polymerization of olefins, the oxidation of mono- and polyolefins, and the reaction of sulfur and hydrogen sulfide with unsaturated hydrocarbons.

Cameron Machine Elects Officers

Cameron Machine Co., Brooklyn, N. Y., has announced the election of three executive officers. H. C. Kinsey, vice-president of the company for the past several years, has been elected president, succeeding W. B. Wilshusen, retired. A. Stirba, Sr., works manager for the past twenty-five years, has been named vice-president, while R. W. Cummings, service manager for eighteen years, has been elected secretary.

Acme Plans Connecticut Plant

Acme Backing Corp., Brooklyn, N. Y., has announced plans for the construction of a new plant at New Milford, Connecticut. Expected to cost approximately $390,000, the new plant will be used for the manufacture of synthetic resin film, coated fabrics, and artificial leather.

Develops New Splicing Machine

A new splicing machine for sealing industrial inner tubes has been developed by the General Tire & Rubber Co., Akron. According to the company, the effectiveness of the new splicing machine was demonstrated in a recent test in which a 16 x 5.00-8 industrial tube was over-

inflated with 8805 cubic inches of air, 19.25 times above its normal capacity which is 456 cubic inches. Before the inflation the wall gauge of the tube was .090-inch thick and after inflation the thickness of the wall gauge had been reduced to .010-inch. Not only did the test prove the strength of the splice, it is claimed, but it also showed the value of the strength of adhesion to the tube.

Organize R. C. Products, Inc.

The Rubber Corporation of America has announced the organization of R. C. Products, Inc., 274 Ten Eyck St., Brooklyn 6, N. Y. This firm, under the direction of Dorothy M. Rice, its president, will take over the business so far conducted by the Rubber Corporation of America in fine waterproof products, including infants' wear, rainwear, household aprons, notions, and bathing apparel. Miss Rice formerly conducted the sundries department of the Rubber Corporation of America which will supply the new company with its waterproof material requirements.

First Dutch Tire Unit Opened

The plant of the Netherlands Tire Industry Michelin in 's-Hertogenbosch, Holland, the first automobile factory in The Netherlands, was opened last month. Ready for operation early in 1940, the plant was dismantled and severely damaged by the Germans during the war. Although present weekly production capacity is estimated at 5,000 tires, the output is expected to be doubled in a few months, with an ultimate production goal of 14,000 tires per week. The plant has also started production of bicycle tires, with an output of 33,000 units monthly.

NEW YORK RUBBER GROUP HOLDS OUTING AT BLASBERG'S GROVE

Approximately 150 members and guests attended the annual summer outing of the New York Rubber Group, held at Blasberg's Grove in Hawthorne, N. J., on Friday, June 27. The outing got underway early in the afternoon and wound up with an excellent dinner. A full program of sports was enjoyed during the day, with practically every member and guest participating in one event or another.

Winners of the various events follow: *Boccie,* teams of Catton and Forman (DuPont), Hassett and Schmidt (American Wringer), and Eckhart and Buffington (Lea Fabrics); *Darts,* R. A. Stephens (C. K. Williams) and John Ryzowitz (Okorite); *Horseshoes,* William Lamela (Okonite) and Frank Brugos (U. S. Rubber); *Egg Tossing,* teams of Abernathy and Forman (DuPont) and Loeser and Provost (U. S. Rubber). In addition to these events, F. M. Tolin (Vanderbilt) and G. N. Brunt (Flintkote) led their respective pick-up teams to victory in two softball contests.

Pete Murawski (DuPont) was chairman of the Outing Committee, assisted by Fred E. Traflet (Pequanoc), H. Frecker (U. S. Rubber), Thomas F. Callahan (Witco), and G. H. Provost (U. S. Rubber). Those in charge of the various events follow: *Boccie,* James Carroll (R. E. Carroll Co.); *Darts,* M. E. Lerner (RUBBER AGE); *Horseshoes,* William Lamela (Okonite); *Egg Tossing,* Thomas F. Callahan (Witco); and *Softball,* G. H. Provost (U. S. Rubber).

Tire Production in April

Although production of tires and inner tubes for the month of April declined from the previous month, the total output for the first four months of 1947 was still ahead of the corresponding period of the preceding year, according to the Rubber Manufacturers Association. Passenger car tire output for April amounted to 6,711,133 units, a decrease of 3.76% from the 6,973,234 units produced during March, while production of truck and bus tires totaled 1,622,109 units against 1,603,883 for the previous month, a gain of 1.14%. Production of inner tubes in April declined 10.45%, from 7,920,552 units to 7,093,113 units. For the first four months of 1947, production of passenger car tires amounted to 27,002,089 units, as compared with 20,113,196 units for the first third of 1946.

Paraffine Acquires Plant Rubber

Plant Rubber & Asbestos Works, 537 Brannan St., San Francisco 7, Calif., has been acquired by the Paraffine Companies, Inc., San Francisco, Calif. Plant Rubber, which manufactures high temperature insulating materials and mechanical packings, will be operated as a division of the Paraffine organization.

CONSULTING TECHNICAL COMMITTEES OF THE OMD RUBBER DIVISION

As reported in a previous issue, the number of technical committees which advise the Rubber Division of the Office of Materials Distribution of the Department of Commerce (formerly the Rubber Division of the Civilian Production Administration) has been reduced from 23 to 11. With some committees which served during and since the war relatively inactive, their numbers have been reduced to simplify administration by the Rubber Division.

Former Consulting Technical Committees for certain segments of the industry have been consolidated under broader classifications and will continue such activity as may be necessary as subcommittees of existing committees. Members making up all of the existing committees as well as the subcommittees are as follows:

Athletic and Rubber Toy

E. C. Brueggeman, Seiberling Latex Products Co., Barberton, Ohio, and G. D. Carlson, Pennsylvania Rubber Co., Jeanette, Penna., Co-Chairmen; R. T. Cartlidge (Sun Rubber); W. B. Frye (U. S. Rubber); H. W. Gill (National Latex Products); J. G. Havey (Wilson Sporting Goods); L. P. Hohlfelder (Barr Rubber); L. W. Isom (Dewey & Almy); Carl Lundgren (MacGregor-Goldsmith); W. J. O'Brien (Seamless Rubber); John Shira (Oak Rubber); T. Van Etten (Midland Rubber); C. A. Webb (Weaver-Wintark); L. C. Weimer (W. J. Voit Rubber).

Chemically Blown Sponge

J. F. McWhorter, Ohio Rubber Co., Willoughby, Ohio, Chairman; C. Vaughn Castor (Brown Rubber); Stanton Glover (U. S. Rubber); S. P. June (Virginia Rubatex); H. S. Liddick (Davidson Rubber); Marcus Orr (Goodrich); U. H. Parker (Dryden Rubber); George Sprague (Sponge Rubber Products); C. H. Zieme (Republic Rubber).

Coated and Combined Fabrics

Harold Nelson, U. S. Rubber Co., Mishawaka, Ind., Chairman; J. F. Anderson (Goodrich); Harry Dannenbaum (Aldan Rubber); Charles Dennison (Archer Rubber); J. L. Haas (Hodgman Rubber); R. R. Lewis (Vulcan Proofing); Hewitt MacPherson (Cambridge Rubber); A. F. Schildhauer (DuPont); G. R. Spangenberg (Rainfair); J. W. F. Young (Federal Leather).

Rubber Footwear

Charles H. Baker, Charles H. Baker, Inc., Providence, R. I., Chairman; V. N. Hastings (U. S. Rubber); J. H. Kelly (Tyer Rubber); H. W. Martin (Hood Rubber); H. A. Stuart (Goodyear Footwear); A. H. Wechsler (Converse Rubber).

Hard Rubber

D. E. Jones, American Hard Rubber Co., Butler, N. J., Chairman; William Dermody (Stokes Molded Products); E. R. Dillehay (Richardson Co.); H. J. Flikkie (Goodrich); F. S. Malm (Bell Telephone Labs.); C. P. Morgan (Vulcanized Rubber).

Foamed Latex Products

J. J. Allen, Firestone Rubber & Latex Products Co., Fall River, Mass., Chairman; C. H. Barnes (Goodyear); M. Berman (Hewitt Rubber); Marcus Orr (Goodrich); W. M. Reid (Dunlop Tire); E. C. Svendsen (U. S. Rubber).

Mechanical Rubber Goods

W. L. Smith, B. F. Goodrich Co., Akron, Chairman; M. Berman (Hewitt Rubber); H. L. Ebert (Firestone); D. F. Harpfer (Goodyear); E. J. Howell (Hamilton Rubber); M. R. Karrer (Electric Hose); J. F. McWhorter (Ohio Rubber); W. W. Sanders (Boston Woven Hose); M. J. Sanger (General Tire); F. C. Thorn (Garlock Packing); W. L. White (Raybestos-Manhattan); C. H. Zieme (Republic Rubber); F. W. Frericks (Cupples Co.); C. H. Mingle (Gates Rubber); V. N. Morris (Industrial Tape); J. D. Morron (U. S. Rubber).

Brake Lining: W. L. White and J. M. Kuzmich, Raybestos-Manhattan, Inc., Passaic, N. J., Co-Chairmen; William Nanfeldt (Firestone Industrial Products); C. A. Schell (Thermoid); R. E. Spokes (American Brakeblok); Edward Wells (Johns-Manville); F. G. Burk (A. P. De Sanno & Son).

Grinding Wheels: W. L. White, Raybestos-Manhattan, Inc., Passaic, N. J., Chairman; H. V. Allison (Allison Co.); F. G. Burk (A. P. De Sanno & Son); H. C. Martin (Carborundum Co.); R. D. Sevick (U. S. Rubber); C. J. Waterman (Bancroft-Hickey Mfg.).

Jar Rings: F. W. Frericks, Cupples Co., St. Louis, Mo., Chairman; Harold Anderson (Ball Bros.); A. R. Brandt (Schacht Rubber); C. C. Davis (Boston Woven Hose); L. J. DeHolczer (Crown Cork); R. D. Gartrell (U. S. Rubber); L. J. Howell (Hamilton Rubber); E. A. Schwarz (Crunden Martin Mfg.).

Rubber Mountings, Shock Absorbers and Dampers: J. D. Morron, U. S. Rubber Co., Detroit, Mich., Chairman; Sherman R. Doner (Raybestos-Manhattan); M. J. Clark (Goodyear); H. L. Ebert (Firestone); H. H. Fink (Goodrich); R. C. Henshaw (Lord Mfg.); R. C. Knapp (U. S. Rubber); J. F. McWhorter (Ohio Rubber); M. J. Sanger (General Tire); H. E. Wening (Inland Mfg. Div., General Motors).

Industrial Pressure Sensitive Tape: V. N. Morris, Industrial Tape Corp., New Brunswick, N. J., Chairman; C. E. Frick (Van Cleef); A. R. Gow (Seamless Rubber); H. J. Tierney (Minnesota Mining); P. F. Ziegler (Bauer & Black).

Rubber Thread: W. L. Smith, B. F. Goodrich Co., Akron, Chairman; J. J. Allen (Firestone Rubber & Latex Products); T. E. Cooper (U. S. Rubber); R. L. Cragan (Lloyd Mfg.); G. R. Keltie (American Wringer); W. M. Reid (Dunlop Tire); Oliver Thompson (Carr Mfg.).

Medical and Surgical Rubber Goods

A. R. Gow, Seamless Rubber Co., New Haven, Conn., Chairman; E. C. Brueggeman (Seiberling Latex Products); W. B. Frye (U. S. Rubber); Ezra L. Hanna (Davol Rubber); A. E. Hosier (Faultless Rubber); George Lenhart (Wilson Rubber); H. S. Liddick (Davidson Rubber); R. J. Limbert (Lee Rubber); C. R. Porterhouse (Pyramid Rubber); Raymond Szulik (Acushnet Process); Marcus Orr (Goodrich); P. F. Ziegler (Bauer & Black).

Rubber Bands: Marcus Orr, B. F. Goodrich Co., Akron, Chairman; C. W. Howlett (Hodgman Rubber); Garrett Roberts (Weldon Roberts Rubber).

Surgical Adhesive Tape: P. F. Ziegler, Bauer & Black, Chicago, Ill., Chairman; John Clark (Parke-Davis); A. R. Gow (Seamless Rubber); David Smith (Johnson & Johnson).

Sole and Heel

W. E. Kavenagh, Goodyear Tire & Rubber Co., Windsor, Vt., Chairman; G. B. Britton (International Shoe); C. F. Hoover (Essex Rubber); R. E. Hughes (International Shoe); L. F. Leatherman (Gro-Cord Rubber); R. W. Lowe (Endicott Johnson); Allen O'Neal (Goodrich); W. F. Ridge (U. S. Rubber); Arthur Ross (Panther-Panco Rubber).

Leather Shoe Manufacturers: G. B. Britton, International Shoe Co., Hannibal, Mo., Chairman; R. G. Ashcraft (Endicott Johnson); Roland D. Earle (Union Bay State); R. M. Freydberg (Acme Backing); J. C. MacKay (J. F. McElwain Co.); M. P. Medwick (New York Rubber Cement); Warren Reardon (Daniel Green Co.); H. M. Spelman, Jr. (Dewey & Almy).

Wire and Cable

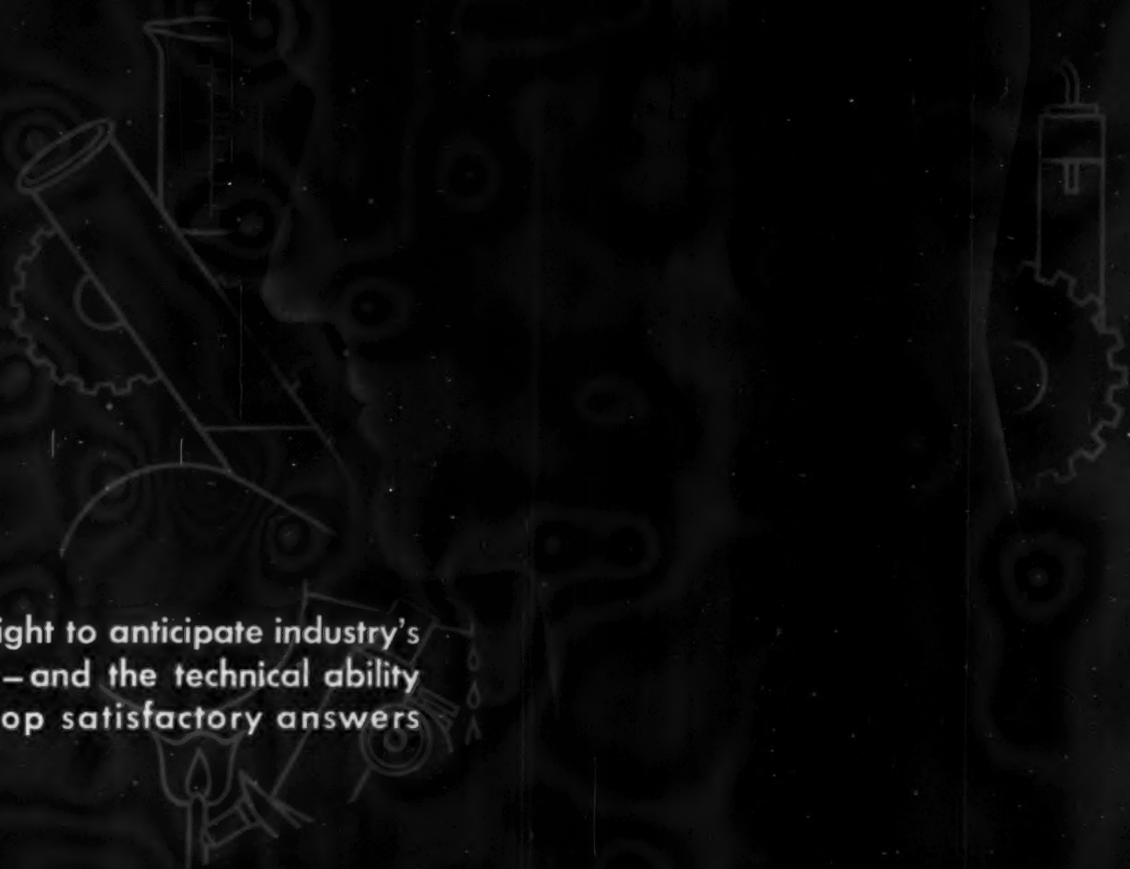
R. A. Schatzel, Rome Cable Corp., Rome, N. Y., Chairman; J. T. Blake (Simplex Wire); A. D. Cummings (Collyer Insulated); John Ingmanson (Whitney Blake); A. R. Kemp (Bell Telephone Labs.); S. J. Rosch (Anaconda Wire); E. D. Youmans (Okonite).

Tire and Tube

H. E. Elden, Dunlop Tire & Rubber Corp., Buffalo, N. Y., Chairman; T. E. Boyle (Goodrich); R. Brasaemle (Lee Rubber); W. H. Denton (Goodrich); E. H. Gibbs (Seiberling Rubber); W. F. Hoelzer (Pennsylvania Rubber); Otto J. Lang (Armstrong Rubber); L. B. Martin (U. S. Rubber); J. E. McCarty (Goodyear); H. J. Niemeyer (Firestone); H. P. Partenheimer (Mansfield Tire); H. B. Pushee (General Tire); J. Rockoff (Dayton Rubber).

Tire and Tube Repair Materials: T. E. Boyle, B. F. Goodrich Co., Akron, Chairman; R. J. Bonstein (Firestone); B. C. Eberhard (Goodyear); L. L. Fortune (Fremont Rubber); D. A. MacDonald (U. S. Rubber); N. E. Ries (Mohawk Tire); F. C. Thiess (General Tire); H. F. Webster (Denman Tire).

FORMULA FOR LEADERSHIP



The foresight to anticipate industry's problems—and the technical ability to develop satisfactory answers

COLUMBIAN CARBON COMPANY

ALWAYS THERE IS A *Leader*

500 TONS OF SMOKE A DAY

COLUMBIAN CARBON CO. • MANUFACTURER

BINNEY & SMITH CO. DISTRIBUTOR

MICRONEX

■

STATEX-K

■

STATEX-B

■

STATEX-93

■

FURNEX

■

COLUMBIAN CARBON CO.
MANUFACTURER

BINNEY & SMITH CO.
DISTRIBUTOR

NEW POLYMERS AUTHORIZED BY OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Rubber Reserve, Reconstruction Finance Corporation since publication of those in our previous issue. Procedures for the distribution and sale of these polymers will be found in our October, 1945, issue. Normally, experimental polymers are produced only at the request of the consumers with 20 bales of the original run set aside for distribution to other interested companies for their evaluation. Such rubber is available in quantities of one or two bales upon request to the Sales Division of Rubber Reserve within six months after the experimental polymer was produced. Subsequent production runs are made if sufficient requests are received to warrant it.

X Number	*Manufacturing Plant*	*Date of Authorization*	*Polymer Description*	*Special Characteristics*
X-395 GR-S Latex	U. S. Rubber, Naugatuck	6/10/47	Same as Type IV GR-S Latex except free styrene (volatile unsaturates) is specified at 0.05% maximum.	For latex uses where a minimum odor is important.
X-396 GR-S	U. S. Rubber, Institute	6/20/47	GR-S-10 except that it is stabilized with 1.5 parts UBUB. Mooney viscosity is 50 to 58.	A non-staining, and non-discoloring type GR-S-10 which is expected to show the improved physical properties, particularly in mineral pigment compounds, which other rosin type polymers exhibit.
X-397 GR-S	Firestone, Lake Charles	6/21/47	GR-S-AC except for a non-staining type shortstopper and stabilization with 1.5 parts BC.	Non-staining and non-discoloring type alum GR-S. Alum rubbers normally exhibit low water absorption properties. Antioxidant BC is newly developed stabilizer.

Committee Chairmen Selected

The New York Rubber Group will act as host to the Rubber Division, A.C.S., at the Fall Meeting of the Division to be held at the Hotel Commodore in New York City on September 17, 18 and 19. At a meeting of the Executive Committee of the New York group held on July 2, E. S. Kern (Vanderbilt) was named chairman of the Local Arrangements Committee. Other committee chairmen named included the following: *Treasurer,* Jean Nesbit (U. S. Rubber Reclaiming); *Registration,* Pete Murawski (DuPont); *Information,* George Wyrough (Philblack); *Hospitality,* D. E. Jones (American Hard Rubber); *Publicity,* R. G. Seaman *(India Rubber World)*, and M. E. Lerner (RUBBER AGE). There will again be a Suppliers' Cooperative Cocktail Party, and Jack Hamilton (Binney & Smith) will function as chairman of the committee in charge of the party, assisted by E. B. Curtis (Vanderbilt), W. Geldard (Neugatuck Chemical), and T. J. Starkie (Witco). The banquet will be held at the Hotel Commodore on Thursday evening, September 18. Banquet tickets will be $7.00 each. The members of the various committees will be announced shortly.

Nostik Rubber Separating Paper

A new rubber separating paper has been placed on the market by the Ace Paper Co., Inc., 426 Broadway, New York 12, N. Y., for interleaving layers of rubber and rubberized material. Designated as Nostik Rubber Separating Paper, the new material is said to be water repellent, light in weight and to offer good yardage.

Shifts in Synthetic Operation

On October 1 the U. S. Rubber Co. will take over operation of the 45,000-ton government-owned synthetic rubber plant at Borger, Texas, now being operated by the B. F. Goodrich Co. At the same time U. S. Rubber will relinquish operation of the government unit at Los Angeles, which it now operates in conjunction with the Goodyear Tire & Rubber Co. Goodrich will continue to operate the government unit at Port Neches, Texas.

Koppers Absorbs Subsidiaries

Pennsylvania Coal Products Co., Petrolia, Penna., and the Wailes Dove-Hermiston Corp., Westfield, N. J., both wholly owned subsidiaries of Koppers Co., Inc., have become integral parts of the parent organization. Pennsylvania Coal Products Co. will be known as the Pennsylvania Coal Products Department of the Koppers' Chemical Division and will be under the direction of Dan M. Rugg, vice-president and general manager of the division.

Union Sued for $500,000

A $500,000 suit has been filed in Federal Court by the Frank G. Schenuit Rubber Co., Baltimore, Md., against Local 293 of the United Rubber, Coke, Linoleum, and Plastic Workers of America (CIO) for alleged violations of the War Labor Disputes Act. The company contends that the employees filed a thirty-day strike notice on May 22 but walked out on June 2, while contract negotiations were in progress.

Moldex Rubber Acquires Plant

The Moldex Rubber & Plastics Corporation, 1 East 57th St., New York 22, N. Y., has purchased all the machinery, equipment, and materials of the Franklin Rubber Corporation. The Franklin Rubber plant, located at 430 East Allegheny Avenue in Philadelphia, will be operated by Moldex Rubber as soon as some alterations and improvements are made. Moldex Rubber expects to start its operations by September 1, and will employ approximately 50 initially. Louis K. Braunston is president and Arthur A. Mayers is vice-president of the Moldex concern. Plant personnel is now being selected and will be announced shortly. The Franklin Rubber Corporation is changing its name to the Franklin Metal and Rubber Co., and will continue operations as a distributing organization.

Rubba-Coat Protective Compound

A new non-inflammable liquid compound which can be applied to highly polished metal parts to protect them from dirt, rust, corrosion, moisture, fingerprints, and smudges during the manufacturing process has been introduced by the Rubba Manufacturing Co., 1015 East 173rd St., New York City. Known as Rubba-Coat, the compound can be applied by brush, spray-gun, or dip method, and can be removed by peeling. It is said to dry quickly and to remain permanently flexible so that metal sheets can be formed without breaking or cracking the coating. The compound can also be applied to painted wood sub-assemblies to protect the paint finish as the completed product takes shape.

CONFERENCE ON LATEX IS CONDUCTED IN MANCHESTER, ENGLAND

Approximately 300 members and guests attended a two-day latex conference, held at the Grand Hotel in Manchester, England, on May 6, under the auspices of the Manchester Section of the Institution of the Rubber Industry. A number of technical papers were delivered during the conference, which also featured numerous group discussions.

George Martin, winner of the Colwyn Gold Medal for 1946, served as chairman of the technical sessions at the Conference. The papers which were presented at these sessions, in groups of three or four, depending upon subject matter, were classified under the following groups: Stability of Raw Latex; Modifications of Particle Charge; Gelling and Coagulation for Technical Purposes; and Future of Latex.

Stability of Raw Latex

Delivering the opening paper on "Characteristics of Clonal Budgraft Latex" at the technical sessions, Dr. I. Kemp described research work performed to determine whether clonal latices are as subnormal in stability to evaporation as latex from a particular clone. The method used in this work was to evaporate the latex to a standard rubber content and keep it under observation in a sealed bottle for several weeks. Out of nine clones examined, only two were fully normal and six were definitely subnormal. Dr. Kemp found no definite biological difference in clonal latex, although adsorbed protein tended to be higher.

In a paper on "Factors Affecting the Stability of Hevea Latex," (read by E. W. Madge) Dr. F. J. Paton said that stability of latex fresh from the tree depends on the clone, the district of the country, the season, and wet weather. Rapid decomposition continues after tapping, the period which largely determines the properties of the ultimate concentrate. To prevent rapid changes in the field, a relatively high concentration of ammonia must be added at once, an uneconomical method as the ammonia is lost in the centrifuge. Sludge may contribute to this, and centrifuged latex was said to be more stable than creamed latex. The addition of Santobrite or some other antiseptic was recommended in preventing the growth of bacteria.

Discussing "Spontaneous Coagulation of Hevea Latex," Dr. G. E. Van Gils declared that coagulation is not due entirely to acid formation, since ordinary soap solutions will also coagulate latex. He pointed out that the amount of soap needed depends upon the magnesium content of the latex; adding magnesium increases the range. Removing magnesium from the latex by dilution or by addition of a small amount of ammonia was said to delay spontaneous coagulation. It appears that soaps formed by magnesium and fatty acids liberated by decomposition of latex constituents are the root cause of the change. Freezing fresh latex causes coagulation, but if the latex is freed from magnesium before freezing, coagulation does not follow.

The variations in the properties of latex purchased by the British Government from the Far East were summarized in a paper delivered by H. C. Baker on "Quality of 1946 Latex Supplies." In his paper, Mr. Baker said that most of the latex examined was taken as "booty" from the Japanese and was found to be of poor quality. He recommended the following methods for improving this latex: (1) Removal of the serum; (2) Addition of KOH; or (3) Addition of sodium p-chlorphenate.

Particle Charge Modifications

Reading a paper on "Evaluation of Creaming Agents," which was written by W. S. Davey and K. C. Sekar in 1941, Mr. Martin declared that all alginates work differently as creaming agents, depending upon their viscosity and polarity. While boiling gum tragacanth solution reduces its viscosity, boiling other creaming agents causes an increase in viscosity. It was pointed out that creaming agents vary very much in stability and that some deteriorate in a few days after being placed on the market.

Dr. C. M. Blow briefly reviewed his previous publications on "Positex," in regard to the principles of preparing and using the material, and the special needs for compounding ingredients. He said that concentrations up to 60% of dry rubber content are obtained with little loss by centrifuging, although cationic soap is lost. Creaming up to 35 to 40% was possible in 72 hours with small additions of Tragasol or methyl cellulose.

According to a paper by Dr. C. Falconer Flint and H. Taylor on "Storage Stability of Latex Compounds," zinc oxide thickening of latex, due to zinc ammonium ions, can be controlled by reduction in ammonia or by increase in hydroxy ions in the latex. A big advance has been made in the discovery of a new "easy" stabilizer which will prevent thickening by simple addition to latex. This is a class of ethylene oxide condensation products, which operate almost exclusively by control of rubber particle hydration. Mr. Taylor illustrated the value of these reagents in a simple latex-zinc oxide mixing, in a ZDC mixing, and in others.

Gelling and Coagulation

A detailed study of several features of the behavior of sodium silicofluoride as a gelling agent was presented in a paper by E. W. Madge and D. W. Pounder on "Gelling Phenomena." The effects of modifying agents which produce either more zinc ions or more fluorine ions were covered by references to several British patents, calling attention to the ease effected in the uniform addition of sodium silicofluoride to troublesome mixings. Attention was also given to the possibilities in controlling the equilibrium gelling state, as indicated by surface tension changes against time.

Another paper, entitled "Recent Developments in the Heat Sensitization of Latex," was presented by S. D. Sutton. Mr. Sutton described the use of Igevin M-50, a product manufactured by I. G. Farbenindustrie for heat sensitization. The process, as applied by Farbenindustrie to synthetic latices, depended upon Igevin M-50 becoming insoluble in water above a temperature of 35° C. The reagent is now known to be a polyvinyl methyl ether. Mr. Sutton indicated that investigations have been made on natural latex, first neutralized by evaporation of ammonia and protected in the neutral state. By suitable adjustment of mixings, latex compounds have been produced which remain stable for months and set at a determined temperature throughout.

A paper by Dr. A. Jarrijon on "Molding of Rubber Goods from Hevea Latex," and another by F. Lepetit on "Natural, Thermal and Biochemical Degradation of Ammoniated Latex," indicated that natural preserved latex of 57% rubber content, after six years storage in glass, although still mechanically stable and compoundable, becomes easily sensitive to zinc oxide at about 70° C., yielding a useful gel of uniform shrinkage characteristics for molding. The gelling period was said to depend on age, temperature, ammonia content and zinc oxide purity. Experiments have been made to obtain the same properties by artificial aging. The best results were reported obtained by either heating at 143° C. for two to three hours in an autoclave, or using a proteolytic ferment at room temperature.

Future of Latex

Dr. P. Schidrowitz, in discussing "Latex Sponge and Its Competitors," first described the initial patent issued to him on sponge rubber. It covered a mixture of natural latex, sodium sulfide, and sodium bicarbonate, with acetic acid coagulation, and cured as a wet coagulum. The sponge was colored with cadmium acetate which transformed to cadmium sulfide. Other sponge rubbers reviewed by Dr. Schidrowitz were Solvar, polyvinyl acetate or alcohol sponge with an aldehyde acid addition, Styrofoam, based on polystyrene, viscose sponge, linoleic acid sponge, and various synthetic rubber sponges. He held the view that natural latex sponge will continue to have advantages over any other rubber variety.

A sketch was given by W. H. Stevens of the patent history of latex as revealed by a study of two blocks of abstracts issued by the British Rubber Development Board, covering the period from 1920 through 1937. In his talk, entitled "Latex Patents—The Situation Today," Mr. Stevens indicated that there were six latex patents issued in 1920, 30 in 1922, 37 in 1925, 199 in 1927, 100 in 1931, 165 in 1932, 189 in 1933, and 190 in 1934. The depression years around 1931 checked the rapid increase in numbers, but there was a recovery which brought the figure to nearly 200 every year from 1934 to 1937. World War II checked

latex patents, according to Mr. Stevens, and there were only six British patents on natural rubber latex issued in 1946.

In a paper on "Tendencies and Likely Future Developments of Latex Applications in the U. S. A.," F. H. Cotton estimated that approximate consumption of latex in the United States for 1947 will be 7,000 tons of Hevea, 25,000 tons of GR-S, and 18,000 tons of GR-M. He noted that GR-S and GR-M at particle sizes of 0.01 micron were very useful in impregnation work. GR-S was said to give a weak film from latex deposits, while GR-M was reported preferred for tensile strength and oil resistance. The ammonia preservative in GR-M was described as questionable since it calls for aeration reduction or formaldehyde addition. The HMT formed in the latter was said to be a serious toxic (dermatitis) nuisance. Mr. Cotton indicated that satisfactory results with foamed rubber demand natural latex.

The final paper, entitled "Some Unsolved Problems of Latex Science and Technology," delivered by T. R. Dawson, presented several problems of a fundamental type in the latex industry. Biologically, Mr. Dawson pointed out, we do not know whether latex is a sol rubber with a surface polymerized skin, or a sol-gel emulsion with a gel skin, or just plain emulsion. Among processing problems, Mr. Dawson referred to the unpleasant "handle" of latex rubber, and to the difficulty of making molds from latex by the simple technique used with gelatin or plaster of paris.

Plans Wire Unit in Cleveland

American Steel & Wire Co. is reported to be considering the construction of a $10,000,000 plant in Cleveland, Ohio, for the production of wire cord for heavy-duty truck tires. According to Clifford Hood, president of the company, which is a subsidiary of the U. S. Steel Corp., the company has taken an option on land in Cleveland which might be used for such a plant, but it has received no appropriation to build yet, and has no building plans.

New Carbon Black Plant

A permit to erect and operate a roller-type carbon black plant in the Richland Parish of Louisiana has been issued to Carbon Blacks, Inc. Gas for the new plant will come from the depleted Richland oil field, and use of 1.5 million cubic feet per day has been authorized. Carbon Blacks, Inc., is headed by J. H. Mann, who owns two or three burners in Texas. The new plant is expected to produce a high grade black.

Named United Kingdom Agents

Typke & King, Ltd., has been appointed sole sales agent in the United Kingdom for rubber chemicals manufactured by E. I. du Pont de Nemours & Co., Inc. The British concern will also handle all sales of neoprene in the United Kingdom.

Rubber in Phonograph Pick-ups

Synthetic rubber is being used by the Admiral Corp., Chicago, manufacturer of radios and radio-phonograph combinations, to replace the usual crystal, filament, and amplifier tube of phonograph pick-ups. The company claims that the pick-up using synthetic rubber is different from anything else in the industry, gives better reproduction, and can be manufactured at a cost low enough for inclusion in its entire line of record changers.

REVISION OF RUBBER ORDER R-1 LIFTS GR-S AND GR-I CONTROLS

Rubber Order R-1, as revised on July 14, 1947, by the Office of Materials Distribution, of the Department of Commerce, eliminates all allocation and inventory controls over GR-S and GR-I, and establishes a simplified method of acquiring natural rubber from government stocks during the present calendar quarter.

The revision includes a provision permitting the consumption of natural rubber to the extent of 10 per cent of hydrocarbon content by weight in all products which previously had been permitted no natural rubber. A new procedure is outlined for the use of natural latex to the extent that the supply permits. This provision is a step toward the elimination of quantitative controls over natural rubber latex. Special limitations on the use of pale crepes of any type are removed, as the result of increased supply and the availability of certain amounts from government stocks. Small companies using relatively small amounts of natural and synthetic rubber no longer are required to report.

Use of natural rubber or natural rubber latex is permitted in several additional product groups. Automotive and aircraft hose and grommets may be manufactured with 25 per cent of natural rubber. Laboratory stoppers and dress shields are placed on a ⅔ natural-⅓ synthetic rubber basis. Cements for any purpose may contain ⅔ natural and ⅓ synthetic latex, and balloons may be made in the same proportions. Bearings for deep well pumps may be produced as the manufacturer wishes.

Consumption of additional natural rubber is permitted in a number of other product groups. In the latex foam products field, manufacturers may use as much as ⅔ natural latex. Previously, they were limited to half natural latex and half synthetic.

Further revision of the Rubber Order, including Appendices I and II, is now under study, and it is anticipated that provisions for the use of the minimum quantity of synthetic rubber considered necessary to national security will become effective early in August.

ANDERSON, DELINE AND BLACK HEAD C.I.C. RUBBER DIVISION

M. F. Anderson, of the Dominion Rubber Co., Montreal, Quebec, and H. G. Deline, of the Dunlop Tire & Rubber Goods Co., Toronto, Ontario, were elected chairman and vice-chairman, respectively, of the Division of Rubber Chemistry of the Chemical Institute of Canada for the 1947-1948 season at the Spring Meeting of the Division, held on June 8 at the Banff Springs Hotel in Banff, Alberta. J. T. Black, of the Polymer Corp., Sarnia, Ontario, was elected secretary-treasurer of the Division.

In addition to the election of officers at the meeting the following members were appointed to the Executive Committee: Bruce Marr (Naugatuck Chemicals); John Ramsay (Gutta Percha Rubber); E. R. Rowzee (Polymer Corp.); and Norman Smith (Dominion Rubber).

The technical sessions of the meeting featured the presentation of seven technical papers, abstracts of which appeared in the May, 1947, issue of RUBBER AGE. The papers dealt chiefly with the fundamental problems of the manufacture of synthetic rubber and its relation to natural rubber.

Titles of the seven papers presented and their authors are as follows: *The Mechanism of Popcorn Formation,* by C. A. Winkler (McGill University); *The Preparation of Controlled Molecular Weight Distribution of Butadiene-Styrene Copolymers Using Tertiary C_{16} Mercapton as Regulator,* by H. Leverne Williams (Polymer Corp.); *The Effect of Temperature and Mixed-Solvent Composition on the Intrinsic Viscosity of GR-S,* by L. H. Cragg and T. M. Rogers (McMaster University); *Combined Ratios of Monomers in Bulk and Emulsion Copolymerizations,* by K. R. Henery-Logan, Maurice Morton and R. V. V. Nicholls (McGill University).

Also, *Some Recent Developments of the British Plastics Industry,* by P. A. Delafield (British Geon, Ltd.); *The Mechanism of Sodium Catalyzed Polymerization of Butadiene in Toluene,* by R. E. Robertson and Leo Marion (National Research Council); *The Physical Testing of Experimental Elastomers,* by S. T. Bowell and N. R. Legge (Polymer Corp.)

Report Exposition Progress

Charles F. Roth, manager of the 21st Exposition of Chemical Industries, which will be held at the Grand Central Palace in New York City from December 1 to 6, reports that widespread interest has developed in the exposition denoting unusual activity in industrial planning and the projection of new enterprises far into the future. Space reservations already assure the complete occupancy of four floors. An increase in exhibits of chemicals has already been noted.

GERMAN SYNTHETIC ADHESIVES COVERED IN NEW OTS REPORT

German synthetic adhesives developed by I. G. Farbenindustrie provided good wartime substitutes for natural rubber adhesive tapes and plasters, according to a report which has been made available by the Office of Technical Services of the U. S. Department of Commerce. Entitled "German Self-Adhesive Plaster and Tape Industry," the report was prepared for the British Intelligence Objectives Sub-Committee. The investigators claim that because of better synthetics, German wartime adhesives were superior to the British products.

The three Farben synthetics chiefly used by German adhesive tape manufacturers were "Oppanol B," a polymer of isobutylene, and "Oppanol C" and "Igevin," both polyvinyl ethers. None of these materials was developed by Farben especially for the adhesives industry. Formulas for their use were apparently worked out by individual manufacturers when the war cut off Germany's supplies of natural rubber. The best results were obtained by combining Oppanol C, a high molecular weight polyvinyl isobutylene ether, with Igevin, a low molecular weight polyvinyl isobutyl ether. From 20 to 30 percent of this mixture was used in combination with such conventional materials as wool fat, zinc oxide and softening oils.

Other Farben Synthetics

Other Farben synthetics used in adhesive manufacture were "Cosal," made of Oppanol C, Igevin and benzine, and "Elaoel," a plasticizer produced from the esterification of polyhydric alcohols with synthetic fatty acids. Buna S was considered unsatisfactory because it deteriorated rapidly when used as an adhesive. "Alresins," turpentine substituted phenols made by Chemische Werke Albert, Wiesbaden, were also favored for use in adhesive tapes. All adhesive manufacturers preferred natural rubber to the synthetics even though the natural product did not age as well as Oppanol plaster.

No cotton was available for use as backing material during the war. Rayon fabrics apparently provided an adequate substitute. Paper, viscose film and cellulose acetate film were also used. The paper was usually a long-fiber creped type, sometimes treated by impregnation with Buna S. Manufacturing technology in the German adhesive plaster and tape industry was considered inferior to the British by the investigators. Machinery was usually antiquated, often involving more hand work than British or American equipment.

Orders for the report (PB-60895; photostat, $3; microfilm, $1; 41 pages) should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

Research Results

Partial findings in a survey recently completed among top executives of industrial corporations, to determine what management expects of scientific research, have been disclosed by Maurice Holland, industrial research advisor of New York City. An analysis of the findings revealed that what corporation heads expected most from research were: First, new products; Second, competitive technical position; Third, reduced production costs. Also expected were increased sales volume and net profit on new processes, assistance to sales with technical services, and service to chief executives in long range planning.

Offers Consulting Service

Lloyd F. Leatherman, who has served for the past five years as chief chemist and factory manager of the Gro-Cord Rubber Co., and previous to that connection was associated with the Seiberling Rubber Co. as a tire and tube chemist, also working on heels and soles, is now offering a technical consulting service to the rubber and allied industries. Mr. Leatherman is a graduate student of rubber chemistry of the University of Akron. From 1942 to 1946 he served as a member of the WPB Advisory Committee on Heels and Soles. The consulting service he offers covers tires and tubes, heels and soles, and molded and extruded goods in general. Mr. Leatherman makes his headquarters at 2016 Lakewood Ave., Lima, Ohio.

GR-S Latex Drum Authorizations

The Office of Rubber Reserve, Reconstruction Finance Corporation, has announced that effective July 1, 1947, issuance of ORR Purchase Authorizations covering purchases of drummed GR-S Latex from distributors will be discontinued. Accordingly, purchases of GR-S Latex in drum lots may now be made directly from the supplier without prior purchase authorization. Purchasers of tank car lots must continue to send their purchase requests to the ORR Sales Division, in accordance with established procedure.

Correction on British Fire

It was reported last month that at least 15,000 tons of natural rubber, part of England's stockpile, were destroyed by fire on June 3. The item was based on reports in the American newspaper press. We have since learned that the fire occurred at one of England's rubber dumps, and the rubber destroyed was actually scrap tires, self-sealing fuel tanks, and other rubber scrap. The dump is located at Mitcham, Surrey, England.

RUBBER DIVISION FALL MEETING SET FOR NEW YORK IN SEPTEMBER

The Fall Meeting of the Division of Rubber Chemistry of the American Chemical Society is scheduled to be held on Wednesday, Thursday, and Friday, September 17, 18, and 19 in New York City, in conjunction with the 112th Meeting of the parent society. The exact number of sessions to be held will be determined by the number of papers submitted.

Divisional headquarters will be at the Hotel Commodore, 42nd Street and Lexington Avenue, where the technical sessions will likewise be held, and those planning to attend are urged to make immediate reservations since the number of rooms available is limited.

Local arrangements for the New York meeting have been placed in the hands of a committee headed by Simon Collier, of the Johns-Manville Corp., 22 East 40th St., New York 16, N. Y. The Divisional banquet, which will be preceded by a cocktail party being arranged by a committee of suppliers, will be held on Thursday evening, September 18, at the Hotel Commodore.

As usual papers were invited dealing with some phase of science and technology of natural and synthetic rubber for presentation at the technical sessions. Abstracts of 200 to 250 words were to have been submitted in triplicate to the secretary of the Division, C. R. Haynes, Binney & Smith Co., 41 East 42nd St., New York 17, N. Y., by July 11.

The Division is again cooperating with other divisions of the society in sponsoring the High Polymer Forum. Abstracts intended for presentation at this Forum were to have been submitted to Dr. H. M. Spurlin, Experiment Station, Hercules Powder Co., Wilmington, Del.

Allis Rubber Corp. Formed

Allis Rubber Corp., 113 North Green St., Chicago 7, Ill., has been organized by the Chicago Belting Co. as a wholly-owned subsidiary to take over the assets of its Aero-Seal Rubber Products Division. Officers of the new company include the following: Edward H. Ball, president; Eloy D. Ekkebus, vice-president and general manager; and J. C. Gallagher, vice-president in charge of engineering. E. H. Ball, Jr., is production manager, while K. Brad Stiles is sales manager.

Gardner Receives Guggenheim Award

Lester D. Gardner, former publisher of RUBBER AGE, as well as of aeronautical journals, has been awarded the Daniel Guggenheim Medal for 1947. The award was made for "outstanding achievement in advancing aeronautics, particularly for the conception and organization of the Institute of Aeronautical Sciences." Previous recipients of the award include Orville Wright and General James Doolittle.

HOLT ANTICIPATES DECLINE IN SYNTHETIC LATEX OUTPUT

The production rate for synthetic latices during the first two months of 1947 was below the average for 1946, and might imply a 1947 production of approximately 10,000 tons of neoprene and 24,000 tons of GR-S, according to a special report prepared by E. G. Holt, rubber advisor for the Office of Domestic Commerce. The production of GR-S latex, which rose rapidly in the first half of 1946, shows signs of leveling off at no more than the average rate for the past year. The average monthly rate in 1946 was 1,133 long tons of neoprene and 2,067 of GR-S, as compared with the average monthly rate for the first two months of 1947 of 838 tons of neoprene and 1,928 of GR-S.

Latex Supply Situation

According to the report, the outlook for production of natural latex is the real key to the latex supply situation. Before the war, Malaya produced half the world output, and the Netherlands East Indies was the other chief source, with Liberia third. The Netherlands Indies produced no latex in 1946 and, since operators of rubber estates there still do not have access to their properties, no production is expected in 1947. Malaya exported 5,382 tons of latex during 1946, and discussions by various authorities indicate that the maximum probable for 1947 is 25,000 tons and that the actual exports might be lower.

Current estimates were reported to indicate that Liberia will increase latex production to approximately 10,000 tons for 1947. Small amounts of latex are all that is expected from other areas. The total world shipments for 1947 seem unlikely to exceed 35,000 tons, of which the United States may receive half.

The prospect is, then, the report points out, that new supplies of latices of all types available to the United States in 1947 will approximate 50,000 tons. This amount can be increased if there is greater demand for the synthetic latices, but the supply of natural latex imported can hardly be materially greater than indicated, while its consumption will be somewhat lower because of the necessity of building up working stocks as imports increase.

Allocation of Natural Latex

In discussing the allocation of natural latex, the report indicates that during the first nine months of 1946, the Civilian Production Administration allocated 4,287 long tons of natural latex for consumption by products. The manufacturer of the so-called less essential products can still obtain natural latex only after the uses for the more essential products have been served, and although supplies are slowly increasing this situation is expected to prevail throughout 1947 at least. There is little prospect in the near future of such free use of natural latex as was characteristic of pre-war times; many products formerly made wholly of this material will be made from synthetic latices, and from dispersions of dry rubber and reclaimed rubber.

Since natural and GR-S latices can be used together, the report states, in products where satisfactory quality results from the use of a small percentage of natural latex with GR-S, there could be a large increase in production if the allocations of natural latex can be increased only moderately above present 1947 expectations. On this and on the exhaustive experimentation by the manufacturers of rubber goods was said to rest the chances for a greater output of products than implied by the tonnage figures indicated.

In the foam sponge industry, according to the report, competitive research is most intensive at present both for satisfactory materials with a minimum of natural latex and for compounds, processes, or techniques that will yield a product of superior quality. The progress made by each firm is a secret; the intercompany exchange of technical information that featured wartime cooperative efforts does not apply in peacetime competition.

SPECIAL SONGS CONTRIBUTE TO SOUTHERN OHIO GROUP'S MEETINGS

The meeting of the Southern Ohio Rubber Group, which was held in Dayton, Ohio, on February 20, a report of which has already been published, was enlivened by a community sing. The "sing" differed from the usual ones, in that a few specially-written songs were sung by the members and guests. Written by Russell J. Hoskin, of the Inland Manufacturing Division, General Motors Corp., who is secretary of the Group, copies of the songs were distributed at the meeting and all those present participated in the "sing." In the belief that these songs should prove of general interest and to encourage other local rubber groups to take similar steps to enliven their meetings, we are publishing them herewith:

WE'RE GLAD TO SEE YOU HERE

(Tune: Farmer in the Dell)

We're glad to see you here
It gives us joy and cheer,
Sure it's true, we say to you,
We're glad to see you here.

The worst is yet to come
Our luck is on the bum
Wait for the speeches, boys,
The worst is yet to come.

We'll suffer thru them all
We'll hang around the hall
But when they all are over, boys,
We'll start to roll the ball.

RUBBER GROUP SONG

(Tune: Marching Through Georgia)

We're the jolly rubber men, we stretch and roll and bounce
We use an awful lot of stuff, some names we can't pronounce,
We don't make a lot of dough, but then we have some fun,
When we all get together.

Hoorah, Hoorah, we make a little dough
Hoorah, Hoorah, we have a lot of fun
First our work and then our play
We'll sing our cares away,
Sou-thern O-hio Rub-ber Group.

EATS

(Tune: Smiles)

There are eats, that make us happy,
There are eats, that make us chew,
There are eats, that take away our pleasure
Such as Hash, and Pork, and Beans, and Stew.

There are eats, that give us indigestion,
There are eats, that put us all to bed,
But the eats, that make us all so happy,
Are the eats that we've just been fed.

Industry Honors A. D. Moss

Officials representing some 75 supplier firms tendered a testimonial dinner to A. D. Moss, retiring as director of purchases of the B. F. Goodrich Co. after 48 years of service, at the Hotel Biltmore in New York City on June 4. Known as the dean of purchasing directors in the rubber industry, Mr. Moss has been chairman of the crude rubber committee of the Rubber Manufacturers Association since 1927. The committee in charge of the testimonial included the following: Bancroft Henderson (American Cyanamid), A. F. Kitchel (Binney & Smith), Harry F. Bailey (Minot-Hooper), C. M. Carr (American Enka), R. H. Eagles (Huber), M. L. Harvey (N. J. Zinc), J. W. Kinsman (DuPont), Joseph Louis (Littlejohn), E. V. Peters (St. Joseph Lead), Harold Poel (Astlett), A. L. Viles (R.M.A.), and R. D. Young (Rubber Trade Association).

Goodyear has introduced a new type of sole and heel which is reported ideal for golfers and hikers. Designated as the Lug Sole and Heel, it features lugs about one-half inch high, spaced one-half inch apart.

NAMES IN THE NEWS

DR. R. M. HITCHENS, who has served as associate research director of the organic chemicals division of the Monsanto Chemical Co., since 1944, has been appointed director of the division, succeeding DR. LUCAS P. KYRIDES, who recently resigned.

HARRY A. WRIGHT, formerly associated with the Texas Co., has been appointed vice-president and general sales manager of the Pacific Rubber Co., Oakland 1, Calif.

DR. L. B. SEBRELL, director of research of the Goodyear Tire & Rubber Co., Akron, has been appointed a trustee of Mount Union College in Alliance, Ohio.

S. W. CAYWOOD, who has been associated with the B. F. Goodrich Co. for the past thirty years, has retired as president of the International B. F. Goodrich Co.

EDWIN V. DUFFY, formerly service manager, and OPHA L. ROGERS, formerly sales representative in the Pittsburgh, Penna., area, for the Pennsylvania Rubber Co., Jeannette, Penna., have been named assistant sales managers of the company.

HAROLD C. ANDERSON, who has been in charge of research engineering and development for the Thermoid Co., Trenton, N. J., since April, 1946, has been appointed vice-president of research engineering and development.

THOMAS J. CROSBY, who was recently released from the Navy after several years of service, has returned to H. Muehlstein, Inc., as manager of its Boston, Mass., office.

HOWARD L. GINAVEN, who has been a member of the foreign operations staff of the Goodyear Tire & Rubber Co. since 1944, has been appointed general superintendent of the company's plant in Wolverhampton, England.

L. G. HUMMEL, secretary-treasurer of the C. P. Hall Co., Akron, has been elected president of the Akron Association of Credit Men.

ELLSWORTH CROCKETT, formerly plant chemist at the gas laboratory of the Polymer Corp., Sarnia, Ont., has been named chief chemist of the company.

GARNET T. DICKSON, manager of customs and purchasing for the Goodyear Tire & Rubber Co. of Canada, has been appointed president of the National Association of Purchasing Agents.

Goodyear Department Reorganized

Reorganization of its purchasing department, with the creation of three division manager posts, has been announced by the Goodyear Tire & Rubber Co., Akron. Division managerships have been assigned to Rollin Chittenden, who has been associated with the company's purchasing department since 1922, Marc W. Laibe, who was made assistant purchasing agent for the company several months ago, and L. A. Murphy, who has been purchasing agent at Goodyear Aircraft Corp. in Akron for the past six years. The company also announced that H. A. Delaney, a member of its purchasing department staff, has been transferred to Goodyear aircraft as purchasing agent.

JOSEPH C. MIRGUET, formerly associated with the Hickok Manufacturing Co., has been named sales manager of the sundries and plastics divisions of the Plymouth Rubber Co., Inc., Canton, Mass.

TIMOTHY G. HAGENS, formerly chief chemist of the C. P. Hall Co., of Illinois, has accepted the Chair of Applied Chemistry at La Salle College, Philadelphia, Penna.

BRADLEY DEWEY, president of the Dewey & Almy Chemical Co., Cambridge, Mass., has been awarded the Medal of Merit by the President of the United States for outstanding service during World War II as Rubber Director and Chairman of the Guided Missiles Committee of the Joint Chiefs of Staff.

IAN D. PATTERSON, who has been manager of the St. Mary's, Ohio, plant of the Goodyear Tire & Rubber Co. since 1939, and MURRELL J. DEFRANCE, who has been associated with the company for the past eighteen years, have been appointed manager and assistant manager, respectively, of the development department of the company's chemical products division.

DAVID MEDKIFF, factory superintendent of the Essex Rubber Co., Trenton 3, N. J., for the past forty years, has retired from that position with the company.

NORMAN L. FLEWWELLIN, formerly director of sales for the Cordo Chemical Co., has joined the Atlantic Tubing & Rubber Co. in a similar capacity, with headquarters at 8 West 40th St., New York 18, N. Y.

Comparative Air Loss System

Data on the use throughout the country of the Comparative Air Loss System as a wartime conservation measure was revealed by A. Schrader's Son, Division of the Scovill Manufacturing Co., Brooklyn 17, N. Y., to members of the press and other guests at the Hotel St. George in Brooklyn on June 10. It was reported that the system proved successful in extending the life of tires and avoiding roadside flats for individual passenger car owners and truck and bus fleet operators during the war. The system depends upon the gauging of tires when they are cool, once each week before adding air. If the pressure of one tire is three pounds below its running mate, the cause should be immediately determined and the condition corrected, thus avoiding a roadside flat.

Harris Opens Rubber Plant

Production was scheduled to start this month at the new rubber plant in Milan, Ohio, constructed by the Harris Products Co., of Cleveland. According to Col. R. D. Schmidt, president of the Harris firm, manufacturers of rubber-insulated bearings and bushings, the Milan factory will be semi-experimental in nature, and will make various types of automotive and industrial rubber products. An initial working force of 15 was planned, with eventual employment reaching 100. C. L. Howells is production manager of the Milan plant.

FINANCIAL NEWS

Firestone Tire & Rubber Co.

Six Months Ended April 30: Net profit of $14,168,206, after deduction for depreciation, interest and taxes, which is equal to $7.07 a share of common stock, and which compares with $12,845,926, or $6.09 a common share, for the corresponding period of the previous fiscal year.

Pantasote Company

First Quarter: Net income of $117,373, which is equal to 25c each on 435,138 common shares, and which compares with $101,892, or 23c a share, for the corresponding period of the previous year. Net sales amounted to $1,343,300 as compared with $978,799 for the first quarter of 1946.

Dayton Rubber Co.

Six Months Ended April 30: Net profit of $1,094,906, which is equal to $2.31 a share on the common stock, and a share, for the corresponding period of which compares with $598,781, or $1.22 the previous fiscal year.

Rubber Factories in China

Of the sixty-nine factories engaged in the manufacture of rubber goods in Shanghai, China, forty-nine are members of the Rubber Goods Manufacturers Guild, according to the U. S. Department of Commerce. Before the war there were thirty manufacturers producing rubber products in Shanghai, but most of these had to suspend operations during hostilities. Within six months after the capitulation of Japan, however, more than fifty factories were manufacturing rubber products. Members of the Guild have at their disposal 242 presses, and their daily output amounts to 20,000 pairs of overshoes, more than 3,000 pairs of ricksha and pedicab tires, and approximately 100 passenger car tires. The products are said to be readily marketed in Shanghai and vicinity, the demand sometimes being greater than the supply.

U. S. Rubber Conveyor Belt

A new conveyor belt, which is said to be 250 to 400% stronger than previous rubber fabric belts, has been developed by the U. S. Rubber Co. The increased strength has been obtained by using a new textile construction of nylon and Ustex yarn that increases permissable working tension of each ply two and one-half times and permits the use of more plies. In addition to greater strength, advantages of increased flexibility crosswise and low stretch lengthwise are reported to make it possible to build longer and heavier belts with excellent troughing qualities. The new belt is expected to carry heavier loads than has been possible heretofore and to eliminate many costly transfer points and extra driving mechanisms in new installations.

Norris Bond-It Cement

A thermosetting elastic composition in cement form has been developed by the Norris Manufacturing Co., 100 Wagaraw Road, Hawthorne, N. J., as an adhesive for bonding all types of natural and synthetic rubbers to fabrics, yarns, and cords of rayon, nylon or cotton. Called Bond-It, the cement can be used to attach natural or synthetic rubber to textile materials by calendering, extruding, spreading or cementing. The cured Bond-It film is said to be waterproof and to have excellent natural aging, oxygen bomb aging, and oven aging properties. Exposure to temperatures up to 300° F. and to lubricating oil at normal temperature is reported not to appreciably affect the strength of the cement bond.

Beacon Devices, 78 Oliver St., North Tonawanda, N. Y., has placed on the market a new unit for inflating tires as well as extinguishing fires. Called the Beacon Tireflator, the unit consists of a steel bottle filled with compressed carbon dioxide and equipped with a control valve for releasing pressure as desired.

Steel wire is used in this experimental tire developed by the U. S. Rubber Co. for use on heavy trucks. Tire in photo has been cut away to show top ply of wire cord. Holding a spool of wire is Arthur E. Benson of U. S. Rubber's tire development department.

Goodyear Hi-Miler Xtra Tred

Development of a new premium "super" truck tire with all plies constructed of nylon cord has been announced by the Goodyear Tire & Rubber Co., Akron. Known as the Hi-Miler Xtra Tred, the new tire is said to be the first truck tire of all-nylon plies introduced to the market. Designed for long distance and high speed service, the new tire is reported lighter, more flexible, and to have improved bruise resistance under the roughest operating conditions. The company claims that the all-nylon construction greatly extends the life of the cord carcass, making it suitable for more recapping than the conventional cotton or rayon cord truck tires, and utilizes full wear of the thick rubber tread featured in tires of this type.

Tire Cord Twist Setting Patents

Patents have been issued to the Industrial Rayon Corp. on a new process of electronic twist setting for tire cord and other textile products. The process, known as Lektroset, has been in use at the company's plants in Cleveland and Painesville, Ohio, for several years. It is said to provide a completely new means of setting the twist in rayon tire cord. Packages of the cord are passed through a high frequency electrical field. This is reported to result in so uniform a reaction that cones containing as much as eighteen or more pounds of rayon tire cord may be effectively treated. The Lektroset process is completed in a matter of minutes, yet it is claimed to insure a uniform twist setting in rayon cord.

Special Acetylene Reports

Detailed information on German acetylene manufacture and the application of acetylene reactions to chemical operations is contained in a group of 13 reports now for sale by the Office of Technical Services, Department of Commerce, Washington, D. C. They include "Emulsion Polymerization of Acrylic Acid Derivatives and Butadiene, Resulting in Artificial Rubber-Like Substances" (PB-42385, 3 pp., $1.00 photostat) and "Gasoline and Oil-Resistant Rubber" (PB-42388, 2 pp., $1.00 photostat). A complete list of these acetylene reports can be secured direct from the Office of Technical Services.

Rubber Golf Club Head

The latest development in golf clubs is reported to be a club which features a head made of hard rubber composition. The club, developed by the Kosar Golf Development Laboratory, Cuyahoga Falls, Ohio, has a shaft of steel and a conventional grip. The compound used for the rubber head, developed by the Firestone Research Laboratories, is said to be slightly harder than wood but not as hard as the fiber inlays in most wooden club faces. It was determined that a composition with a synthetic rubber base was better than one with natural rubber. Firestone is producing the rubber head for the Kosar Laboratory.

Sandwich Adhesion Process

A new process for joining rubber, plastics, metals, and glass so as to withstand a shearing stress of over 200 pounds per square inch has been developed by Samuel Cabot, Inc., 72 Oliver Building, Boston, Mass. Called Sandwich Adhesion, the process requires no heating, thinning, or any special treatment. It works by spreading "Plasgon" over each surface and inserting a layer of fabric in the center. The "sandwich" with the fabric in the center is pressed and allowed to set for forty-eight hours. The company claims that the results of this plastic adhesive technique cannot be dislodged by shock or jarring.

Tetrahydrofurane Made Available

A new solvent and intermediate, known as tetrahydrofurane, has been developed by the Celanese Chemical Co., 180 Madison Ave., New York 16, N. Y. The solvent is said to be one of the most effective for vinyl compounds and to offer possibilities in terms of specialized solvent activity for synthetic rubber, the cellulosics, alkyd resins, and organic chemicals. As a chemical intermediate, it is reported potentially useful in making adipic and succinic acids, related anhydrides, and other important chemicals. Now available in experimental amounts, the material is scheduled for quantity production in the near future.

NEWS IN BRIEF

One of the largest rubber expansion joints ever produced is nearing completion at the U. S. Rubber plant at Passaic, N. J. Twelve and one-half feet long and more than seven feet wide, the joint will be used to convey steam from a turbine to condenser in a New Orleans, La., power plant.

Columbian Carbon Co. has announced that its production and shipments of carbon black for the first two months of 1947 have been well ahead of the corresponding period of the previous year. Production in 1946 amounted to 266,272,195 pounds and shipments totaled 296,493,365 pounds.

Development of a non-fogging Pliofilm for the packaging of fruit, vegetables and other foodstuffs has been announced by Goodyear.

U. S. Rubber Export Co. has been appointed exclusive export distributor for the Prufcoat protective coatings and Prufite transparent waterproofing of Prufcoat Laboratories, Inc.

An all-plastic clothesline made of strands of rayon cord jacketed with a white coating of Koroseal has been introduced by Goodrich. Produced in two sizes, .150 and .175 inches, the line is said to stand a pull from 300 to 350 pounds.

A new elastic fabric, called Kuron, which does not depend upon elastic yarn or rubber thread for elasticity, has been developed by U. S. Rubber. Produced by condensing specially designed fabrics to shorter lengths, spreading with natural rubber latex, drying and curing, the fabric can be made to vary in stretch from 50% to 150% of the length of the material.

A. Schulman, Inc., scrap rubber processor and dealer, has signed a long-term lease with the New York Central Railroad for a three-acre industrial site in Jersey City, N. J.

An odorless and non-refrigerated method of shipping shrimp and other highly perishable seafoods by rail express has been introduced by Goodyear. The shrimp are boxed in a lightweight corrugated board, called Insulpaks, which are lined with Pliofilm to prevent seepage.

A new technical bulletin, entitled "Effect of Mixing Temperatures on Neoprene Tread Stock" (BL-220), has been made available by the DuPont Rubber Chemicals Division.

A new underlay for use under carpets in hotels, theaters, restaurants and other public places is being manufactured by U. S. Rubber. Made of chemically blown sponge rubber, the underlay is said to increase carpeting wear almost one third.

A 425,000 cubic foot lighter-than-air ship, designated as the "Puritan," has been added to the Goodyear blimp fleet. The ship is said to be three times as large as the blimps now touring the country under the Goodyear name.

The seventh pamphlet in the series on "Controlling Chemical Hazards," has been made available by the Division of Labor Standards of the U. S. Department of Labor, Washington 25, D. C. Entitled "Clean Air—Removal of Dusts," the pamphlet describes various controls that can be used in industry for the prevention of nuisance and toxic dust exposure.

Martin Rubber Co. has acquired the AcRil Dental Corp., Long Island City, N. Y., and is now manufacturing the complete line of AcRil products at its Long Branch, N. J., plant.

A project which would launch the company into the commercial production of polyvinyl chloride plastic on a major scale has been approved by the board of directors of Monsanto. The project involves the construction of manufacturing facilities at Springfield, Mass.

Conveyor belts are being produced at the rate of $20,000,000 a year because of the greater industrial uses for these transportation strips, according to E. W. Stephens, manager of belting sales for Goodyear.

All business formerly handled by the key warehouse maintained by the Thermoid Company in Chicago has been transferred to a newly-acquired warehouse in Wabash, Indiana. The move was planned to increase the company's service to customers in the central and mid-west trading areas.

A crawler tractor with rubber treads, a new innovation in farming equipment, is now being made by the Cletrac Division of the Oliver Corporation. The rubber tracks used on the vehicle were especially developed by Goodyear.

U. S. Rubber recently announced that it was resuming the production of rubber bathing shoes for the first time since 1941. The shoes will have a special rubber sole to prevent pebbles and seashells from hurting the feet.

PAUL R. McCAMPBELL

factory manager of the I. B. Kleinert Rubber Co., whose election as a vice-president of the company was recently announced.

The feather-light men's rubbers made in Brazil, known as Galocha Moderna, have again been made available in the United States by A. K. Mauro, Inc., Land Title Building, Philadelphia 10, Penna. These rubbers are non-skid, perspiration-proof and long-wearing.

Electric Hose & Rubber Co., of Wilmington, Delaware, recently announced a price reduction averaging 18.3% on its entire line. Some items, according to the company, were reduced below their prewar level.

General Tire & Rubber Co. has resumed production of its premium C. D. truck line tires. This line was discontinued during the five-year war period because of the standardization of tire building during the emergency.

Hewitt Rubber has announced that its Maltese Cross conveyor and elevator belting again is in production. It is offered in straight-ply, stepped-ply and shock-pad construction. It is also available in a special construction for handling hot materials.

Drying and heat treating systems along the lines of those operating in Goodyear plants throughout the United States are being installed in the company's plants located in foreign countries. The systems are designed, built and installed by the John Waldron Corp., New Brunswick, N. J.

"Self-Cleaning Strainers for Steam, Air, Gas or Liquid Service" is the title of a new bulletin which has been made available by the Leslie Co., 184 Delafield Ave., Lyndhurst, N. J.

Cuts Migration Troubles In GR-S Sponge

CIRCOSOL-2XH . . .

Used by Leading Manufacturers of Sponge Rubber

"Our chief reason for using Circosol-2XH," says the research director of a prominent manufacturer of rubber sponge, "is that it is less migratory."

This Company uses Circosol-2XH in processing sponge rubber which is later cemented in place with the common reclaim rosin-type adhesives.

After testing Circosol-2XH they found it softened the rubber satisfactorily and did not migrate, "bloom" or affect the cement as ordinary processing oils did. Circosol-2XH gives them a margin of safety in manufacturing and helps to make possible higher production and more satisfactory application.

Circosol-2XH is a processing aid, refined by Sun as an elasticator for GR-S. It is widely used throughout the industry to speed up processing and to increase the resiliency of finished GR-S products. For complete information on Circosol-2XH and other "Job Proved" Sun processing aids for rubber, write Department RA-7.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

SUN
SUNOCO
INDUSTRIAL PRODUCTS

LOS ANGELES NEWS

The Los Angeles Rubber Group will hold their annual summer outing this year on Catalina Island. According to the proposed program, it will be one of the most successful and largest outings ever held by the Group. Eighty members are expected to attend.

The festivities are to begin with a banquet Friday night, July 25th, at the Avalon Inn. At 5:00 A.M. the following day, a fishing trip is scheduled for the Isaac Waltons, followed by a luncheon at the Visitor's Country Club at noon.

On the afternoon of the 26th, a golf tournament is to be conducted during which any form of heckling will be allowed to distract the contestants. Those who have survived the outing at that point will try their hand at baseball.

The following committee-personnel were lined up: Tway Andrews (H. M. Royal), and Al Pickard (Braun), golf; Al Frederico (C. P. Hall), baseball; W. Blount (Kirkhill), fishing; Carl Hoglund (Goodyear), reception and housing.

A new mine trailing cable, devised by two ingenious Salt Lake City engineers, provides a new protection on this source of explosive sparks that promises to save the lives of countless coal miners in the future. United States Rubber Company engineers demonstrated the new cable recently, featuring a copper braid over the conductor that traps current leakage and prevents explosions.

E. T. Day, manager of the local Mechanical Goods Division of the rubber company, explained that the trailing cable carries power to drills, loaders, and cutting machines, and when it is broken by accident, a too common occurrence, the resulting current leakage may build up an arc. In this case an explosion may occur, he said. The partial copper braid over the "hot conductor" which Day designed, catches the incipient power leakage and routes it through a sensitive circuit breaker that cuts off the power before arcing can occur.

The new cable was subjected to every conceivable test at the Kenilworth Mines' shops. It was pulled at right angles against a pipe edge by a hydraulic hoist. A section of the cable was run over by a 15,500 pound mine car, and another section was squeezed in a vise. In each case the cable worked perfectly. The electricity was drawn off harmlessly by the shield and the circuit breaker opened immediately to stop the flow of power.

Curtis R. Wolter, formerly associated with the Naugatuck Chemical Div. of the U. S. Rubber Co., is now connected with the Witco Chemical Co. in Los Angeles. As Chairman of the Los Angeles Rubber Group and one of the best known rubber executives in Southern California, Mr. Wolter has the sincere wishes of his friends for success.

H. M. Royal (H. M. Royal, Inc.) is now enjoying a trip throughout the Northwest, which will include fishing in Canada. William R. Snyder (R. T. Vanderbilt) is also planning a trip up north. Tway Andrews (H. M. Royal) has just returned from a three-week vacation trip to the East.

The following Southern California rubber industry executives visited the San Francisco Bay Area during June: Raymond E. Bitter (Goodrich Chemical), D. C. Maddy (Standard Chemical), Ray Morath (Naugatuck Chemical), and William R. Snyder (R. T. Vanderbilt).

The B. E. Dougherty Co. recently opened an office in San Francisco under the management of Arthur E. Wolff. This new office will service the rubber, paint and allied trades throughout Northern California.

Butyl Bicycle Tubes Superior

Tests indicate that bicycle inner tubes of butyl rubber hold air from three to ten times longer than natural rubber tubes, according to Noel M. Lanham, bicycle tire manager of the U. S. Rubber Co. In an air retention test conducted by U. S. Rubber at Indianapolis, Ind., the front wheel of a balloon tire bicycle was equipped with a butyl tube and the rear wheel with a natural rubber tube. Both tubes were inflated to 35 pounds. After 28 days the butyl tube had lost only 2½ pounds, while a natural rubber tube lost 24 pounds. A similar test on a lightweight bicycle, with starting inflation pressures of 60 pounds, showed a butyl loss of 15 pounds and a natural rubber loss of 43 pounds.

Buys Worcester Wire Concern

Pittsburgh Steel Co. has announced the acquisition of the Johnson Steel & Wire Co., Worcester, Mass., manufacturer of high carbon wire for tires and other products. The Johnson organization, which will continue operations under its own name as a subsidiary of the Pittsburgh concern, has its main plant at Worcester and branch plants and warehouses at Akron, Ohio, and Los Angeles, California. Charles D. Johnson will remain as president of the new subsidiary.

Holds Conference in New York

A two-day sales and technical conference was held recently by the Binney & Smith Co. at its headquarters at 41 East 42nd St., New York 17, N. Y. At the conference, sales and technical trends were discussed and future policies of the company were outlined. Discussions were conducted by A. F. Kitchel, president of the company, and J. M. Hamilton, assistant to the president.

OBITUARIES

C. William Wood

C. William Wood, who served as factory manager of the Hodgman Rubber Co., Framingham, Mass., during the war years, died at the Union Hospital in Framingham on May 10. He was 46 years old. Born in Clinton, Mass., in 1901, Mr. Wood joined the Apsley Rubber Co. shortly after graduating from high school. He later went to the Cambridge Rubber Co., remaining with that concern for several years, during which time he improved his technical knowledge by taking courses at Boston University. He then joined the Tyer Rubber Co. and in 1928 became associated with the Servus Rubber Co. as pattern man and designer, later being promoted to personnel manager and then factory superintendent. From 1936 to the start of World War II, Mr. Wood served as eastern representative for the George C. Clark Metal Last Co. He received a commendation from the Chemical Warfare Service at the end of the war for his outstanding contributions in the development work done on the combat gas mask carrier. A widow survives.

Clarence R. Bollinger

Clarence R. Bollinger, vice-president of the Goodyear Tire & Rubber Co. of Argentina, died in Buenos Aires on June 21 at the age of 55. He suffered a cerebral hemorrhage two weeks prior to his death. A native of Akron, Mr. Bollinger was associated with the Goodyear organization for forty-one years. He served the company in Singapore, the East Indies, and then was assigned to various branches in the United States. In 1927, he was transferred to the Argentine branch of the company.

Joseph F. McLean

Just as this issue went to press we learned with regret of the death of Joseph F. McLean, president of the Pequanoc Rubber Co., of Butler, N. J., and a leading figure in the rubber industry for the past fifty years. Mr. McLean died on Friday, July 18. Funeral services were held on July 21. A complete obituary will appear in the next issue.

There's ***PERBUNAN*** *in this U. S. Rubber product . . .*

Perbunan was selected by United States Rubber Company engineers and technicians for the tube of their U. S. Peerless Fuel Oil-Distillate Hose because of its

- *Ability to handle a wide variety of petroleum hydrocarbons . . . ranging from fuel oil to aviation gasoline.*
- *Aging qualities required for a* rugged, *long-life hose . . . one that is adaptable for either home fuel oil delivery, or for airplane refueling.*
- *Flexibility . . . in sub-zero weather . . . and trouble-free service on hottest summer days.*

Perbunan now contains a *new stabilizer* that permits it to be used in delicate colors where good color stability during service is desirable.

If you have any rubber compounding problems, call on our rubber engineers. They will gladly cooperate. Or write to the nearest address below.

For Improved Rubber Parts . . . Compound with ➔

Resists damage from water, oil, excessive heat, abrasion and petroleum hydrocarbons . . . retains flexibility at sub-zero temperatures!

PERBUNAN
REG. U. S. PAT. OFF.

THE RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

ENJAY COMPANY, INC. (Formerly Chemical Products Department, Stanco Distributors, Inc.) 26 Broadway, New York 4, N. Y.; First Central Tower, 106 South Main Street, Akron 8, Ohio; 221 North LaSalle St., Chicago 1, Illinois; 378 Stuart Street, Boston 17, Mass. West Coast Representatives: H. M. Royal, Inc., 4814 Loma Vista Avenue, Los Angeles 11, California. Warehouse stocks in Elizabeth, New Jersey; Los Angeles, California; Chicago, Illinois; Akron, Ohio; and Baton Rouge, Louisiana.

{Copyright 1947, Enjay Company, Inc.

CANADIAN NEWS

A drop of two cents a pound in the price of Buna S, from 18½ to 16½ cents, has been announced by Hon. C. D. Howe, Reconstruction Minister. Buna S, principal product of the Crown-owned Polymer Corporation plant at Sarnia, Ont., actually assumed the new price on June 1st, although the announcement was made weeks later.

Both Buna S and Butyl had been reduced in price last November from 20.35 cents a pound to 18½ cents. The new price of 16½ cents for Buna S is more than 19 cents lower than when Polymer first began operations in September, 1943. Price of Butyl rubber remains unchanged at 18½ cents a pound.

Believed to be under consideration, is a plan whereby the Canadian industry will agree to take a certain output of Buna S each month. Desired, is an assured sale to Canadian tire companies to permit Polymer's entire operation to continue at a rate between 3½ to 4 million pounds monthly.

If Canadian tire companies will underwrite a proportion of this over-all production goal, it is suggested that an arrangement could be made whereby they could obtain Buna S from Polymer at about half a cent cheaper than the present price.

E. J. Brunning, president and general manager of the Consumers Glass Co., Montreal, has been elected president of the Polymer Corporation, succeeding D. W. Ambridge, who resigned under pressure of private activities. Mr. Ambridge will continue to serve on the Polymer directorate.

Several changes in Polymer's executive personnel have also been announced. E. R. Rowzee, formerly director of research and development, has been named manager, succeeding A. P. Mechin who becomes assistant to the president. L. D. Dougan, who continues as assistant manager, will have additional new responsibilities.

Dr. E. J. Buckler, formerly technical superintendent, is now manager of research and development, with H. R. Emerson succeeding him as technical superintendent. Stanley Wilk, formerly costs administrator, is now comptroller, and George C. Weir is assistant comptroller. H. G. Foucar is the new technical controller, with F. A. Bain and Fred Walsh as assistant technical controllers. A. E. Slater has been appointed engineering supervisor in the field.

In an hour-long visit at Polymer recently, Their Excellencies The Governor General and Viscountess Alexander caught a glimpse of the industrial future of Canada's "chemical valley." Greeted warmly by enthusiastic crowds of employees, Their Excellencies drove slowly through the plant to the river front where they entered and inspected the steam and power plant, largest in the Dominion.

Conducted by Vice-President and General Manager J. R. Nicholson, they surveyed the plant and adjacent property from a vantage point atop the power plant's turbine roof. They expressed keen interest in the extensive Dow projects and other developments which are making Polymer the hub of a vast new chemical industry in the St. Clair Valley.

Later, in the finishing building of C. S. R., the Vice-Regal Party witnessed the making of Buna S from the coagulation stage to the final baling and packaging. At the styrene finishing building they inspected a sample of styrene monomer.

Annual report of the Viceroy Manufacturing Co., Ltd., for the year ended February 28, 1947, shows net earnings of $80,231, against $82,472 a year earlier. The preference shares were redeemed during the year and after providing $6,213 for dividends paid on these shares prior to redemption the net was equal to 62.7 cents a share on the 118,192 common shares outstanding. In the year ended February 28, 1946, net after preferred dividends was equal to 61.6 cents a share on the issued 100,000 common shares.

Earned surplus, giving effect to payment of dividends, transfer of $212,000 from capital surplus and adjustments, was substantially higher at $466,129. Working capital of $739,260, despite refunding operation, was up from $388,074 at February 28, 1946.

During the year the 3¼ per cent, 3¾ per cent and 4½ per cent first mortgage bonds to the principal amount of $372,000 were redeemed and replaced by a new issue of $660,000, 2½ per cent to 3½ per cent first mortgage bonds.

Most of the major rubber plants in Ontario have reached agreements with the United Rubber Workers Union (CIO-CCL). The majority of these agreements are based on a wage increase of 9 cents an hour across the board, plus three additional paid holidays and two weeks' holiday after five years of service. Agreements have been signed by Viceroy, Gutta Percha and Seiberling, all of Toronto, and Firestone, of Hamilton. Acceptance of a wage offer ranging from 9 to 16 cents was approved by the Goodyear union.

Orders on hand with the British Rubber Co. of Canada, Huron Manufacturing Co. and J. H. Connor & Son, are sufficient to assure capacity operations for the balance of this year, reports A. L. Mailman, president.

Another Canadian company recently invited public subscription of its shares for the first time with an offering of $750,000—the British Rubber Company of Canada Limited 5 per cent cumulative redeemable sinking fund preferred shares by McLeod, Young, Weir & Company Limited, the underwriters. The offering price was $100 per share to yield 5 per cent.

The British Rubber Company of Canada Limited is an operating and holding company which was incorporated under Quebec law in 1935. It manufactures and markets a complete range of rubber footwear, bicycle tires and tubes and other molded rubber products.

Through wholly-owned subsidiaries, Huron Manufacturing Company, Limited, and Montreal Shoe Stores, Ltd., it is also engaged in the manufacture and marketing of a wide range of other products, including leather footwear, slippers and moccasins, and, through J. H. Connor & Son, Ltd., and Castings of Ottawa, Limited, washing machines for domestic and commercial use and commercial laundry equipment.

With the gradual increase of supplies from the Far East, there has been a liberalizing of rubber controls, and manufacturers in Canada are now permitted to use two-thirds natural rubber to one-third synthetic in production of rubber footwear. This is a welcome development from the factory standpoint.

The settlement of the recent labor dispute has cleared another cloud from the horizon. In the plants of the three major producers of rubber footwear affected (two of them in all lines and the other in heavy goods and boots) the striking employees finally returned to work. The situation, therefore, as regards the 1947-48 season appears brighter.

The increased cost of labor has made it necessary for WPTB to grant an increase in wholesale prices which will advance the cost to the consumer 10 to 25 cents a pair.

Consumption of natural rubber by manufacturers in April totalled 2,476 long tons compared to 2,440 in March, synthetic rubber 2,942 long tons compared to 2,876, and reclaimed rubber 1,395 against 1,570, the Bureau of Statistics reported. Domestic production of synthetic rubber in April amounted to 4,628 long tons against 4,466, while reclaimed production was 360 long tons, the same as March.

R. C. Berkinshaw, vice-president and general manager of the Goodyear Tire & Rubber Co. of Canada, has been elected president of the Canadian Manufacturers' Association. At its recent annual meeting in Banff the association stated that it plans to extend its work to give "a more accurate conception" of the relationship which should exist between management and workers and between manufacturers and the public.

Accelerators
Plasticizers
Antioxidants

A Complete Line of Approved Compounding Materials

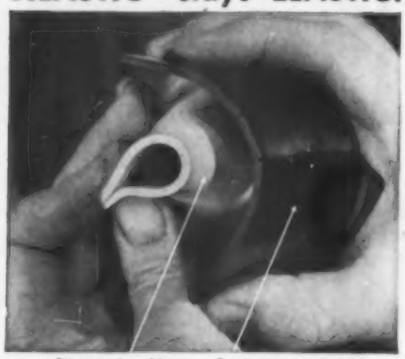
The C. P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL. • SAN FRANCISCO, CALIF.

Silicone News

DC

SILASTIC* stays ELASTIC!



Silastic after 68 days at 300° F. | Synthetic organic rubber after 1 day at 300 °F.

We've been talking for some time about the exceptional stability of Silastic, the Dow Corning Silicone Rubber. We've proved it in many applications where extremes of temperature caused the most stable of organic synthetic rubbers to fail in a few hours or a few days. But it's still hard to believe that there is now available an entirely new kind of rubber-like material useful at temperatures far above and below the limits of any organic rubber.

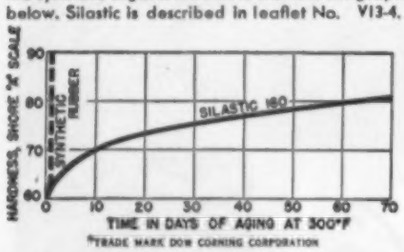
This column of new data will give you a better idea of how heat-stable Silastic really is. You may remember a previous column giving brittle points ranging from −70 to −100° F. for the same Silastic stocks. It's more than a slogan—Silastic stays elastic in oven heat or arctic cold.

Effect of Aging at 300° F.

Test Sample	Weight Loss, %	Shrinkage, %	Decrease in Elasticity, %
Silastic 160 after 61 days	2.8	2.6	12
Synthetic Rubber[1] after 1 day	8.6	3.5	75

[1] One of the most heat-stable synthetic organic rubbers.

The increase in the hardness of Silastic 160 compared with one of the most heat resistant of the synthetic organic rubbers is shown in the graph below. Silastic is described in leaflet No. V13-4.



*TRADE MARK DOW CORNING CORPORATION

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

New York • Chicago • Cleveland • Los Angeles
In Canada: Fiberglas Canada, Ltd., Toronto
In England: Albright and Wilson, Ltd., London

Dow Corning
FIRST IN SILICONES

Dow Corning Silicone Products include

FLUIDS
Damping
Hydraulic
Dielectric
Waterproofing
Lubricating
Diffusion Pump
Mold Release

GREASES
High Temperature
Low Temperature
Valve Lubricants
Stopcock
High Vacuum

COMPOUNDS
Ignition Sealing
Antifoam A

RESINS
Electrical Insulating
Laminating
Protective Coatings

SILASTIC*
Molding
Extruding
Coating
Laminating

*Trade Mark
Dow Corning
Corporation

NEW EQUIPMENT

Cambridge Direct-Reading pH Meter

The "Industrial Model" is a new and unusual addition to the pH equipment made by the Cambridge Instrument Co., 3754 Grand Central Terminal, New York 17, N. Y. Besides the routine measurement of the acidity or alkalinity of small test samples made at a bench or table, this new meter can also be used for

continuous indication directly on processing operations—with the meter located at a considerable distance from the electrodes, if desired.

Hooks on the back of the sturdy metal case permit suspension of the meter over a vat or tank, mounting on a wall, or hanging from a rack. Over-all accuracy is .10 pH, range 0 to 14 pH. Line-operated from any 110-volt 50 or 60 cycle A.C. outlet, the instrument is specially designed and ruggedly built to stand up under plant use.

Even unskilled workers will have no difficulty in making accurate pH determinations with this meter. The large, clear scale is set at an angle at the top of the case so pH values can be read at a glance. Only two simple operating adjustments are required for standardization. Extremely high stability has been attained through improved galvanometer and electronic circuit design; for most applications re-calibration will seldom be required oftener than once a week.

Compact in size—7 x 8½ x 11¼ inches—and weighing only 10 pounds, the instrument is conveniently portable. The electrode assembly is an integral part of the meter and is mounted on the inner side of the door of a compartment in the case; out of the way and protected from accidental damage. Opening the door brings out the electrodes ready for use. The glass electrode is completely shielded to eliminate electrostatic interference and can be used directly in grounded solutions. Compensation is automatic for variations in solution temperature from 0° to 100°C., and for changes in ambient temperature. A voltage regulator corrects for line-voltage fluctuations from 100 to 130 volts.

NO *fitting..*

NO *shaping..*

NO *costly hand-sewing..*

WHEN YOU BALE WITH

Jefco Jute Tubing is *different!* It's a seamless, continuous, tubular baling cloth whose elasticity and flexibility provide smooth, close-fitting coverage of a wide variety of shapes and sizes, without costly hand-finishing operations. Write for details today.

JEFCO JUTE TUBING

A product of THE J. E. FRICKE CO.
40 N. Front St., Phila. 6, Pa. • Mills at Hulmeville, Pa.

CONTINENTAL MACHINERY CO.
261 BROADWAY - - NEW YORK 7, N. Y.

•

Designers and Manufacturers of

RUBBER PLANT EQUIPMENT

- **All types of Rubber Machinery and Plant Equipment for every requirement of Large and Small Factories.**
- **Complete Plant Design and Layout: also Special Machinery Developed and Manufactured.**
- **Specialists in Latex Equipment.**
- **Complete Laboratory Facilities for Chemical and Product Development and Research.**
- **Technicians Furnished for Factory Design and Operation in all countries.**

Cable Address "Contimac" New York

COMCO

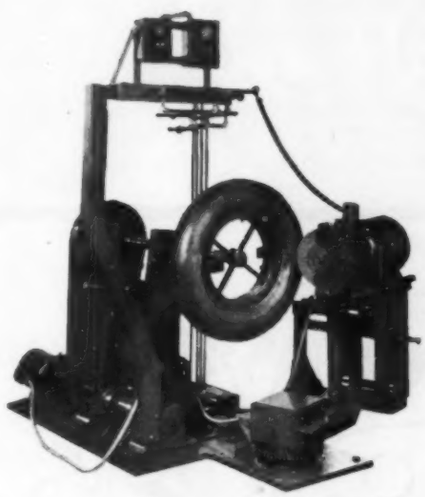
Telephone WOrth 2-1650

FOREIGN OFFICES

CONTINENTAL MACHINERY CO. 33 Boulevard des Bastignolles, Paris 8, France. Andre Berjonneau, Manager

ROGER WILSON & CO., LTD. Speaking Tile Walk, Birmingham 15, England
ANCHOR CHEMICAL CO., LTD. Manchester, England

Automatic AIR BAG BUFFER...



REDUCE AIR BAG MAINTENANCE COSTS

One man can operate two machines and buff sixteen to eighteen bags per hour.

Standard unit will buff all sizes from 14″ bead diameter to 24″ bead and 14.00 cross-section.

Buffer follows contour of air bag without manual assistance.

WRITE FOR FULL DETAILS

The Akron Standard Mold Co.

Akron *"The Established Measure of Value"* **Ohio**

CAPITOL LINER PROCESS

•

If the use of talc or soapstone causes dust and dirt in your plant, besides creating a health hazard, why not solve this problem as have many rubber concerns by using liners treated with our CAPITOL LINER PROCESS.

Take advantage of our trial run offer and convince yourself.

•

Send us 50 or 100 yards of liner material. We will treat it without charge and return for testing in your plant.

•

We *flameproof*, *mildewproof*, and *waterproof* cotton fabrics.

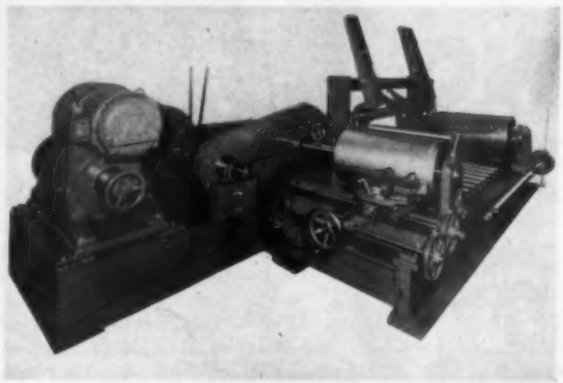
TEXTILE PROOFERS, INC.

181-193 Culver Ave., Jersey City 5, N. Y.

Originators of the Capitol Liner Process

Belt Building and Cutting Machine

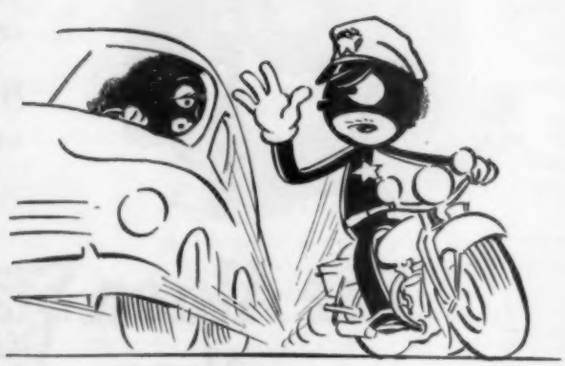
Designed for building industrial V-belts, and provided with a cutting attachment for cutting the belts into shape, a new two-drum belt building and cutting machine has been introduced by the Howe Machinery Co., Inc., 30 Gregory Ave., Passaic, N. J. The two



drums can be adjusted easily by using two 2½-inch diameter precision-machined screws. The cutting device is made with adjustments for setting the stationary knives to various angles to conform with the belt angles. A self-reading tape on the rear of the machine enables the operator to adjust the belt length setting quickly.

While the belt is being constructed its lower portion is supported by removable ball bearing roller frames that can be placed into position according to the belt lengths. The upper portion of the belt is supported by rollers mounted in the frame which can be swung out of position by simply lifting them to the rear. Serrated angular tiltable rollers and side guides attached to the upper tiltable roller frames insure straight travel of belts while cutting.

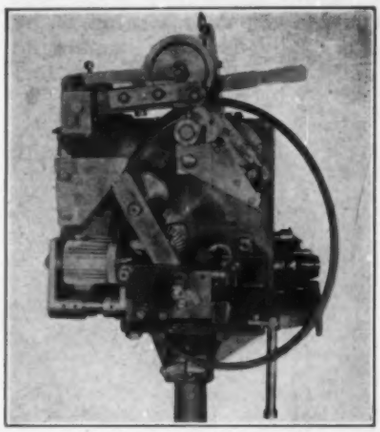
The new Howe Belt Building and Cutting Machine is equipped with a vari-drive unit with two speed changes—high and low, the low being used for building belts and the high for the cutting operation. The capacity of the unit is from 100 inches up.



LESS ACCELERATION WITH PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 388

Utility Crimper Type Flipper
for
Truck and Large Balloon Tires



UTILITY MANUFACTURING COMPANY
Cudahy, Wisconsin

Cable Address: UTILITY-MILWAUKEE
Long Distance Phone Call
MILWAUKEE—SHERIDAN 7020

SIMPLEX
REG. TRADE MARK

RUBBER STRIP CUTTER
PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.

SPECIAL FEATURES
- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion-induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

Now in use by many leading Rubber Manufacturers & Jobbers

Simplex Cloth Cutting Machine Co., Inc.
Manufacturers of a Complete Line of Cloth Cutting Machinery
270 West 39th St. New York 18, N. Y.
Cable Address—SIMPLEX, N. Y. *Phone*—WIsconsin 7-5547

ROYLE STRAINERS
For Greater Efficiency

- **An easy, rapid flow of stock with but little rise in temperature**
- **Less time lost in cleaning and changing screens**
- **These are among the features that make the choice of a Royle Strainer a profitable investment**

JOHN ROYLE & SONS

ROYLE
PATERSON
N. J.

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880

James Day (Machinery) Ltd.
London, England
REgent 2430

Home Office
J. W. VanRiper E. B. Trout
SHerwood 2-8262

Akron, Ohio
J. C. Clinefelter
JEfferson 3264

Los Angeles, Cal.
H. M. Royal, Inc.
LOgan 3261

PATERSON 3, NEW JERSEY

ROBINSON
PROCESSING UNIQUE EQUIPMENT

SAW TOOTH *Crushers*

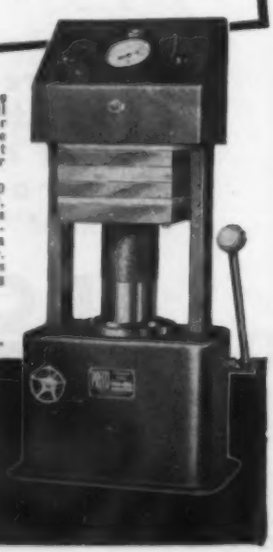
Improved Type!

Rugged construction. Crushes material to finished size. Blades spaced to your specifications. Capacity from 3 to 15 tons. Roller bearing mounted shaft. Robinson Processing Equipment designed by engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

ROBINSON MANUFACTURING CO.
Plant: Muncy, Pa.
SALES REPRESENTATIVE
MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N.Y.

USED BY RUBBER COMPANIES FOR THESE JOBS

Laboratory and Experimental Work
Synthetic Rubber Moulding
Plant Control
Vulcanizing



Rubber companies are saving money by using Preco Presses for experimental and small production runs — eliminating the need for interrupting production on larger presses. The Preco Press is ideal for many types of plant control jobs as well as in the laboratory for research.

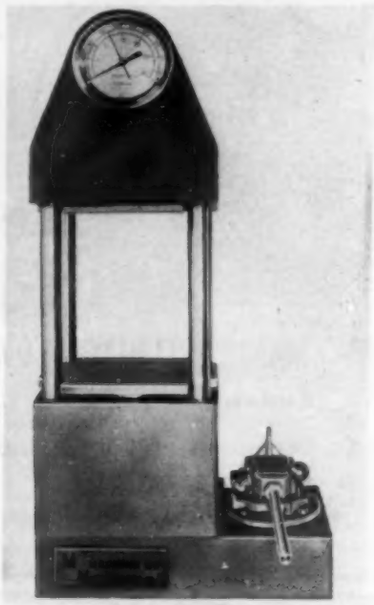
The two-stage hand pump develops 40,000 pounds pressure on 8"x8" electrically heated, water cooled platens. 8¼" x 12" platens as well as steamheated platens are also available. The press can be equipped with a third platen to double the platen capacity. The pressure and temperature heat controls are extremely accurate. Maximum opening between platens is 8 inches.

PRECO INCORPORATED
952 E. 61st St., Los Angeles 1, Calif.

PRECO *Hydraulic* **PRESS**

M & N Hydraulic Hobbing Presses

A new line of completely self-contained hydraulic hobbing presses, in capacities ranging from 30 to 400 tons, was recently introduced by the M & N Machine Tool Works, 144 Orono St., Clifton, N. J. These presses can be successfully used for blanking, forming, and drawing of heavy materials. Laboratories find them



readily suitable for testing materials for compression experimental work on rubber, plastics, and powder metallurgy. A feature of these presses is the compactness of design—four columns, upward-moving platen, completely self-contained unit with pump and motor in the base. The power connection is the only outside connection required. Another feature is the ability of the presses to retain complete control over pre-determined pressure. Once the controls are set, and regardless of the number of times the press is in operation, the pressure remains constantly at the pre-determined level. Devoid of platen, the presses are so constructed as to permit the use of hardened steel pressure discs for hobbing purposes. Illustrated is the laboratory hydraulic press—Model L-30—used for fine work requiring accurate hydraulic press. The capacity of this model is 30 tons.

Splash-Proof Synchronous Motors

Heavy-duty synchronous motors for constant speed drives up to 1,000 h.p. have been made available by the Electric Machinery Manufacturing Co., Minneapolis 13, Minn. Featuring splash-proof construction, the stator frame is steel-strong without excessive weight. Brush inspection and blowing out is simplified with access plates designed for speedy removal and replacement. The sealed bearings can be cleaned and refilled without motor disassembly. Double-end ventilation is provided by a blower at each end of the rotor. The exciter is also fitted with a blower. The new motors are available in unity or leading power factor, with torque and kva requirements to suit the job.

Books....

RUBBER RED BOOK—1947 Edition
Directory of the Rubber Industry
Cloth Bound, $5.00
(Publication Date October, 1947)

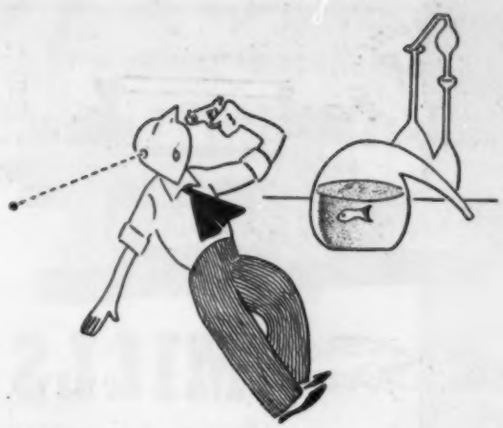
ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For 1935 (Paper binding only) $1.00
For 1937 (Paper binding only) $1.00
For 1938-39, Cloth binding $4.00
For 1940-41, Cloth binding 5.00

RECLAIMED RUBBER
The Story of an American Raw Material
By John M. Ball
Cloth binding $5.00

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederck Marchionna
Bibliography of latex patents and literature from June, 1932 to January, 1937; rubber derivatives to January, 1937. Combination Price, Vols. II and III $10.00

Published by

THE RUBBER AGE
250 West 57th St. New York 19, N. Y.



Why this laboratory man...

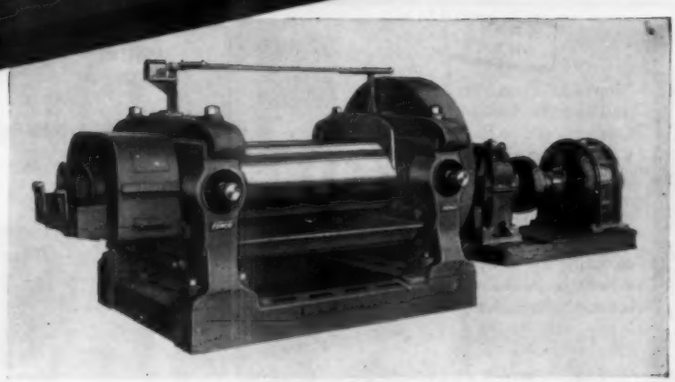
After long, hard technical training, he got his first job in a rubber lab. With the optimism of youth, he carefully worked out the formula for the mix and painstakingly indicated the roll temperature. When golf balls were reported in the warming-up rolls he looked in at the mill room. Sure they followed his dope sheet. Sure the guy in charge knew the heat... been guessing it for twenty years. What was the use . . . B-A-N-G!! Instead of sending flowers they bought a Cambridge Roll Pyrometer for the next guy.

Cambridge Surface Pyrometers are accurate, dependable, quick-acting instruments. Send for bulletin 1945.

CAMBRIDGE
ROLL • NEEDLE • MOLD
PYROMETERS

CAMBRIDGE INSTRUMENT CO., INC.
3754 Grand Central Terminal New York 17, N. Y.

RUBBER & PLASTICS HEAVY DUTY MILLS



STURDY, dependable and built for long life, EEMCO Mills are made in standard sizes from the 12-inch Laboratory Mill up to and including an 84 inch Mill. Furnished as single units or for operation "in line" of two or more. Floor level drives are provided when wanted. Write EEMCO for your Rubber or Plastics Processing Machinery needs - - - early deliveries are now being made.

Sales Representatives

MIDWEST
HERRON & MEYER OF CHICAGO
38 South Dearborn Street
CHICAGO 3, ILL.

EASTERN
H. E. STONE SUPPLY CO.
OAKLYN, N. J.

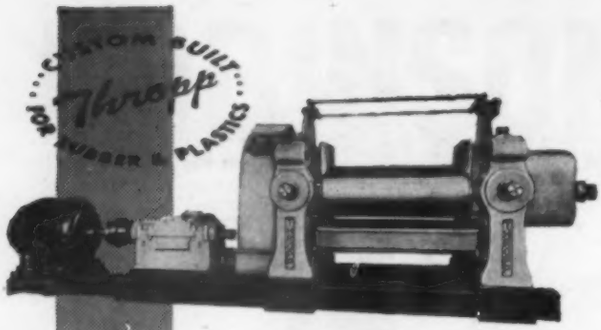
OHIO
DUGAN & CAMPBELL
907 Akron Savings & Loan Bldg.
AKRON, OHIO.

MILLS • PRESSES • TUBERS
EXTRUDERS • STRAINERS
WASHERS • CRACKERS
CALENDERS • REFINERS

EEMCO ERIE ENGINE & MFG. CO.
953 EAST 12th ST., ERIE, PENNA.

870-Ton Multiple Opening Platen Press

An 870-ton multiple opening platen press of four-column type was recently developed for processing rubber and plastic sheets by the R. D. Wood Co., Public Ledger Building, Philadelphia 5. Penna. The cylinder unit of the new press is cast integrally with a substantial square base supporting the press on the foundation. Both the top and moving platens are made of heavily-ribbed cast steel of box-section design. The heating platens are made from special-process, rolled, firebox steel, smooth-tool finished and parallel to within .003 inch. Asbestos insulation minimizes heat dissipation into heavy castings, being provided between the top and the moving platens and the adjacent heating platens.



New Hi-Speed MILLS

22" & 22"x60" Extra Heavy Duty

Extra Heavy Duty Individual Motor Driven Mill with 15" diameter journals, having 150 H.P. enclosed herringbone gear drive. Machine is equipped with solid bronze lined bearings having oil closure seals on side of the boxes facing the rolls to prevent oil contamination of the stock. Steel cut connecting gears and Johnson Rotary Joints. Manzel mechanical lubricator and new style guides bored to fit the rolls. This is just one of the many new Thropp precision built mills designed to speed up post war production.

West Coast Representative
H. M. Royal Inc.
Los Angeles, Cal.

Thropp

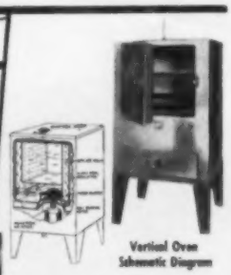
WM. R. THROPP & SONS CO.
Trenton, N. J.

PRECISION Freas MECHANICAL CONVECTION Laboratory OVENS

SAVES SPACE

"Precision"-Freas Vertical Type Mechanical Convention Standard Cabinets save floor space and offer peak oven efficiency for hundreds of laboratory applications. Heat transfer by mechanical convection with a powerful turbo blower forcing air through working chamber affords uniform heat distribution regardless of loading intensity and very rapid heating to desired temperatures. The "Precision"-Freas Constant Temperature Cabinets are recognized as the "Top Performers" in laboratories throughout the world.

Write for Catalog 230-B for details on complete "Precision"-Freas Line



Vertical Oven Schematic Diagram

Large Double Door Vertical Oven

See Your Laboratory Supply Dealer

Precision Scientific Company
3737 WEST CORTLAND STREET CHICAGO 47, ILLINOIS, U.S.A.
Scientific Research and Production Control Equipment

REMOVE THE NERVE WITH PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 388

RANDALL & STICKNEY

Hand Grip Rubber Gauge No. 3-B

Height .....9"	Length .....9¾"	Range .....½"
Depth of Throat ...6½"	Dial 50 Divisions Each Div. 1/1000"	Weight ....4 lbs. Frame . Aluminum

Designed for gauging stock as it is coming from the calender.

FRANK E. RANDALL CO., Waltham 54, Mass.

MACHINERY MERCHANTS

Rubber and Plastic Machinery

NEW — *Domestic and Export* — USED

LABORATORY-PRODUCTION

Accumulators	Platens
Aprons	Presses
Boilers, H. P.	Pumping Units
Brakes	Pumps
Calenders	Refiners
Crackers	Rolls
Cylinders	Sheeters
Drive Units	Tensile Testers
Gauges	Timers
Gears	Valves
Mills	Vulcanizers
Mixers	Washers

Complete Plants
Plant Engineering—Reports—Appraisals

•

GRANT ENGINEERING CO.

JOHN GRANT, Pres.

2640 Prairie Ave. Chicago 16, Ill.

Telephones: VICTORY 1232-1233

We PROCESS LINERS of All Types ★

A Note or Wire Will Bring You Prices and Full Data Promptly

We also manufacture Mold Lubricants for use with synthetic as well as natural rubber.

J. J. WHITE PRODUCTS CO. ★

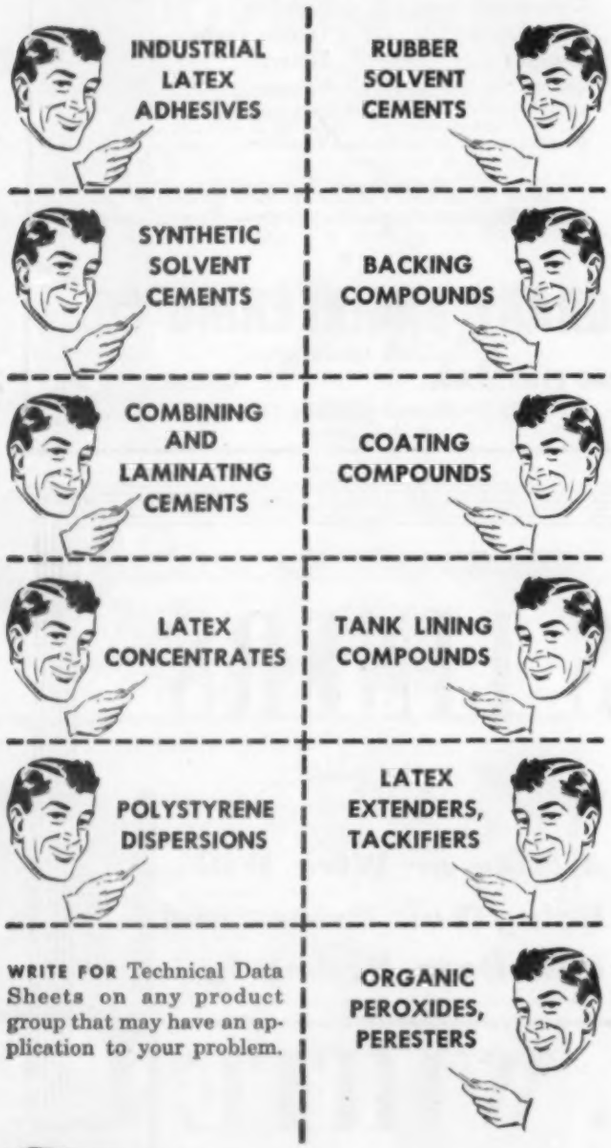
7700 STANTON AVE.
CLEVELAND 4, OHIO

★ ***IMPROVE YOUR PRODUCTS by having us treat your fabrics to render them . . .***

MILDEW-PROOF • FLAME-PROOF WATER-PROOF

OUR ENGINEERS WILL GLADLY CALL AT YOUR CONVENIENCE

Serving Industry with Creative Chemistry



UNION BAY STATE
Chemical Company Inc.
50 HARVARD STREET, CAMBRIDGE 42, MASS.

REVIEWS

BOOKS

Phenoplasts: Their Structure, Properties and Chemical Technology. By T. S. Carswell. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. 6 x 9 in. 267 pp. $5.50.

A good deal of new information relative to the phenoplasts has appeared in the literature in the past several years, but hitherto has not been collated. This book describes, as accurately as the present information will permit, the physical and chemical structure of the phenoplasts, and correlates their structure with their mechanical and chemical properties, the author exerting every effort to thoroughly cover the literature, particularly of the past ten years. Little reference is made to patents, except when the patent is so basic that it has historical value. As the author points out in his preface, the patent literature although voluminous has little theoretical value.

Containing seventeen chapters, the book covers a wide range. Starting with a chapter on the history of the development of the phenoplasts, it covers chemical structure; phenoplasts from higher aldehydes and polyhydric phenols; physical structure; fillers for phenoplast molding powders and laminates; mechanical properties of both molded and laminated phenoplasts, electrical and thermal properties; chemical resistance; technical manufacture; molding techniques, and finally, technical applications. Brief reference is made to the vulcanization of rubber with phenol alcohols, based on the work of van der Meer. Author and subject indexes are included.

•

An Introduction to Engineering Plastics. By D. W. Brown and W. T. Harris. Published by Technical Division, Murray Hill Books, Inc., 232 Madison Ave., New York 16, N. Y. 6 x 9 in. 274 pp. $4.00.

Designed to acquaint engineers and industrial designers with the wide field of applications of plastics to engineering, and to assist them in making the best use of plastics, this book admirably achieves its purpose. The presentation is comprehensive, yet simplified to the extent that the specialist in one field need spend a minimum of time obtaining information about another field. Included are descriptions of the various thermoplastic and thermosetting materials and their chemical and physical properties. Subjects covered include engineering tests and specifications, fillers, adhesives, molds and molding processes. metal coating, high frequency heating, etc. An appendix lists materials, their applications, trade names, and manufacturers. A second appendix gives recommended tolerances for phenolic and urea moldings. There are twenty chapters in all, plus a subject index.

•

Low-Pressure Laminating of Plastics. By J. S. Hicks. Published by the Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y. 6 x 9 in. 162 pp. $4.50.

This book represents a convenient, usable compilation of the rudimentary information required by the beginner who wishes to embark upon the field of low-pressure and contact-pressure laminating of plastics. It outlines the several steps necessary to fabricate a laminate, points out sources of materials required, and enumerates some of the pitfalls to be avoided. The subject matter is divided into eight chapters, covering the following: the general field of plastics; design and use of molds; resins, catalysts and curing; reinforcements for plastics and sandwich structures; properties of plastics; illustrations of laminating tank cover, boat deck, and milk bottle case; joining and machining of plastics; and product analysis. The latter chapter covers engineering and cost principles. An outline for laboratory experiments is given in an appendix. Patent and subject indexes are included.

Now Available . . .

A NEW BOOK

"RECLAIMED RUBBER"

The Story of an American Raw Material

by JOHN M. BALL

This, the first comprehensive book on Reclaimed Rubber, just published by the Rubber Reclaimers Association, Inc., combines data from countless magazines, books, pamphlets, reports, patents, and court testimony, with much new data gathered by the author from various sources.

It is well illustrated with over 75 photographs and charts on all phases of reclaimed rubber manufacture and production. Included in the chapter on Manufacture is a series of interesting flow diagrams on the various commercial reclaiming processes—Digester (Alkali), Pan, and Acid.

The book contains a wealth of historical, commercial and some technical data of interest and value to the rubber manufacturer as well as to the student and others interested in the subject of rubber reclaiming.

CONTENTS

1. Early History; 2. Mitchell and the Acid Process; 3. Marks and the Alkali Process; 4. Miscellaneous Reclaiming Processes; 5. Companies and Associations; 6. Scrap Rubber; 7. Manufacture; 8. Properties and Uses; 9. Statistics; 10. World War II. Epilogue. Bibliography. Index.

Size—6"x 9"

248 pages—Indexed

PRICE (Postpaid)

$5.00* In United States

$5.50 in Other Countries

(*) Add 2% Sales Tax for N. Y. City Addresses

Exclusive Sales Agents:

RUBBER AGE

250 West 57th St., New York 19, N. Y.

Stabelan "A"

Patent Applied For

•

This well known stabilizer for vinyl resins is equally effective in compounds of vinyl and Acrylonitrile rubbers in improving resistance to light . . . both ultra-violet and Florida.

Prevents stiffening, embrittlement and discoloration.

•

STABELAN CHEMICAL CO.
P.O. Box 665
TOLEDO 1, OHIO

PIGMENTS and CHEMICALS for the RUBBER INDUSTRY

★

THE CALDWELL COMPANY

First National Tower, Akron 8, O.

FRanklin 6139

REVIEWS (CONT'D)

Petroleum Production. Vol. III. Oil Production by Water. By Park J. Jones. Published by the Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y. 6 x 9 in. 271 pp. $5.00.

This is the third of a five-volume group on "Petroleum Production," which deals with the application of the basic engineering principles of drilling oil wells and extracting the oil most efficiently and economically. This volume is limited to oil production by water, and primary gas caps and oil production by gas are not considered. It treats with the principal factors involved in the production of oil by water, including convergence, fluid factors, invasion factors, displacement factors and well interference factors. The book is divided into two parts, the first treating with foundations and the second with applications. There are 13 chapters, plus a subject index.

•

Theory and Application of Radio-Frequency Heating. By G. H. Brown, C. N. Hoyler, and R. A. Bierwirth. Published by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, N. Y. 6 x 9 in. 370 pp. $6.50.

Publication of this volume has been prompted by the numerous questions propounded by engineers skilled in their profession but unfamiliar with radio-frequency phenomena, plus the fact that the technical literature is meager where the basic principles of radio-frequency heating are concerned. As indicated by its title, the book covers the theory and application of radio-frequency heating, and should prove most valuable to industrial engineers who have occasion to use radio-frequency generators in solving heating problems. Many rubber engineers now find themselves with this situation, and this book will prove helpful.

•

Fabric Structure. By John H. Strong. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½ x 8½ in. 241 pp. $6.00.

The characteristics, requirements, testing and treatment of the various threads used in weaving are explained in this book. In addition, considerable space is devoted to finished textile products and their method of manufacture. Among the materials discussed are regular twills, satins and sateens, cord weaves, pique fabrics, extra wool weft and warp fabrics, backed and double fabrics, and novelty fabrics. There are 21 chapters in all, plus a subject index.

BOOKLETS, CATALOGS, etc.

Special-Built Time Switches for the Volume User. (Bulletin T-55). Automatic Temperature Control Co., Inc., 34 East Logan St., Philadelphia 44, Penna. 8½ x 11 in.

This bulletin treats with typical examples of low-cost time switches now being produced by the company for the special needs of original equipment manufacturers. Six examples have been chosen in each of which timing operation has been achieved especially to do the intended job. The examples cover switches supplied for electronic heating machines, control instruments, battery recharging equipment, and dairy equipment.

•

A Trip Through Hercules Land. Hercules Powder Co., Inc., Wilmington 99, Del. 11 x 8½ in. 20 pp.

This non-technical booklet points out some ways in which the company's products are utilized in manufacturing processes and finished products in many diverse fields. The twelve major industries covered are rubber, adhesives, protective coatings, plastics, textiles, synthetic fibers, soap and disinfectants, insecticides, ink, construction, paper, and mining. In addition to the more complete story of the use of the company's products in the twelve major industries, a list of 41 industries and the company's products utilized in each is included.

If you process NEOPRENE

You'll want these Free Bulletins

If you process Neoprene, here are two bulletins which will be of interest to you. They contain technical data derived from tests in which magnesia products were involved. They are primarily concerned with Scorch Resistance, which is of special interest during the summer months.

Copies of these bulletins 47-1 and 47-2 will be gladly sent you on request. Please write on company letterhead.

GENERAL MAGNESITE & MAGNESIA COMPANY

Specialist in Magnesia

MANUFACTURERS—IMPORTERS—DISTRIBUTORS

Architects Building **PHILADELPHIA 3, PA.**

Sales Representatives:

AKRON, OHIO—
Harwick Standard Chemical Co.
BOSTON, MASS.—
Harwick Standard Chemical Co.
BUFFALO, N. Y.—
Chemical Sales Corp.
CHICAGO, ILL.—
Harwick Standard Chemical Co.
DENVER, COLO.—
Denver Fire Clay Co.
LOS ANGELES, CAL.—
Harwick Standard Chemical Co.
MIDDLE ATLANTIC STATES—
Harwick Standard Chemical Co., Trenton, N. J.
NEWARK, N. J.—
Chas. S. Wood & Co., Inc.
PORTLAND, ORE.—
Miller & Zehrung Chemical Co.
ST. PAUL, MINN.—
George C. Brandt, Inc.
SEATTLE, WASH.—
Carl F. Miller & Co.
TRENTON, N. J.—
General Supply & Chemical Co.
TORONTO, ONT., CANADA—
Standard Chemical Co., Ltd.
MONTREAL, QUE., CANADA—
Standard Chemical Co., Ltd.

*DAREX Copolymer X34

A HIGH STYRENE RUBBER RESIN

FOR QUALITY BRIGHT COLORED RUBBER PRODUCTS

Darex COPOLYMER X 34 GIVES YOU THESE PROPERTIES IN YOUR RUBBER PRODUCTS:

Darex X 34 is especially valuable and economical for clean looking, easily cleanable flooring and light colored molded mechanical goods. X 34 is stabilized with stalite antioxident. It may be readily blended with natural rubber, synthetic rubbers, or mixtures of the two. Usually processed in a hot Banbury, X 34 may be used in two ways.

1 In highly loaded compounds, five to ten parts give marked improvement in flex and tear resistance.

2 In low-loading, bright colored stocks, 20 to 40 parts give high hardness, superior abrasion and flex-cracking resistance, and low specific gravity.

- Increased stiffness and hardness
- Greatly improved abrasion and flex-cracking resistance
- Low specific gravity and *light color*

WRITE FOR SAMPLES AND RECOMMENDATIONS FOR YOUR PRODUCTS

*T M REG. U. S PAT OFF

FOR OPEN MILL MIXING, USE DAREX COPOLYMER NO. 3

DEWEY AND ALMY CHEMICAL COMPANY ORGANIC CHEMICALS DIVISION CAMBRIDGE 40, MASSACHUSETTS

As a MOLD LUBRICANT

—Orvus permits articles to leave molds readily; molds clean easily.

—Orvus is effective in hardest water.

—Orvus forms no insoluble materials which might be deposited as a film on mold or rubber.

For WASHING and FINISHING

—Orvus cleans thoroughly such articles as inner tubes, automotive parts and other molded and extruded rubber goods. Leaves articles with a pleasing finish.

Write for further details about Orvus.

PROCTER & GAMBLE
CINCINNATI, OHIO

ORVUS is a sulfated alcohol type cleanser—not a soap.

FREE TECHNICAL DATA FILE for RUBBER MANUFACTURERS

A Few Typical Uses of SONNEBORN Petrolatums

- Softening and plasticizing
- Dispersion of curing chemicals
- Reduction of internal friction
- Pre-mounting lubrication of tire treads
- Vehicle for glycerin and carbon black

- Gives complete information on properties and characteristics of SONNEBORN Petrolatums, suggesting adaptability to wide range of applications. Highest quality—a type for every service. Prompt delivery.
- Mail, phone or wire order, or write for Technical Data File F-203 for Rubber Manufacturers.

SONNEBORN PETROLATUMS U.S.P.
White Oil and Petrolatum Division
L. SONNEBORN SONS, INC., N. Y. 16, N. Y.
DEVELOPING BASIC MATERIALS FOR BASIC INDUSTRIES

REVIEWS (CONT'D)

The Chemistry of Fatty Acids. Armour Chemical Division, Armour & Co., 1355 West 31st St., Chicago 9, Ill. 8½ x 11 in. 12 pp.

This technical bulletin presents a brief survey of the chemistry of fatty acids and their major types of derivatives. It describes the sources of fatty acids together with their chemical composition. General reactions involving the double bonds, such as oxidation, polymerization, hydrogenation, halogenation, sulfonation, and sulfation, as well as general reactions involving the carboxyl groups, are discussed. Structural formulas and applications of the major derivatives of fatty acids, including soaps or salts, acyl halides, esters, acid anhydrides, ketenes, ketones, aldehydes, alcohols, amides, nitriles, and amines are furnished. Tables are included on the saturated and unsaturated fatty acid series, giving common name, chemical formula, molecular weight, and melting point.

•

Pressure Processing of Synthetic Resins. (Bulletin No. 4404). Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. 7¾ x 10⅜ in. 20 pp.

Designed for the layman who has had little or no association with the plastics industry, this booklet deals with the more popular types of thermosetting and thermoplastic resins. The properties and applications of two types of thermosetting resins, the phenolics and urea formaldehydes, and various thermoplastic resins, such as the cellulosics, styrene resins, acrylics, vinyls, vinylidene chloride plastics, and nylon, are described. The processes used to convert these resins into end products are discussed and the company's compression molding, injection molding, transfer molding, and extrusion presses are described and illustrated.

•

Tire Valve Converting Manual. A. Schrader's Son, Division of Scovill Manufacturing Co., Inc., 470 Vanderbilt Ave., Brooklyn 17, N. Y. 8½ x 11 in. 20 pp.

With the development of the new wide base rim and "W" tube for trucks and buses, the tire valve converting and replacement practice has changed accordingly. This manual contains the latest and most complete information regarding the correct bending of the five standard convertible tire valves on "W" tubes whether used on wide base rims or present standard rims, as well as the correct bending of the six standard convertible valves on former standard tubes when used on present standard rims. It also discusses the valve to use for a specific rim and tube combination.

FOR RESISTANCE TO CUT AND CRACK GROWTH USE PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 388

NEOPRENE COMPOUNDERS!

investigate **Baker's**
CALCINED MAGNESIA

Baker supplies what neoprene compounders demand—Calcined Magnesia that is always uniform.

Test it in wetting power—in ease of dispersion—stability of compounded stock—rate of cure—tensile strength and plasticity.

Learn why Baker's Light Calcined Magnesia is better.

Send for free samples

J. T. BAKER CHEMICAL CO.
Phillipsburg, New Jersey

• COMPOUNDS CURED AND UNCURED • PLANTATION RUBBERS • BALATA • BUNA S • ACRYLICS • ACETATE • BUTYRATE • VINYL RESINS • POLYSTYRENE • AUTO TIRES • SPLIT PARTS • HARD RUBBER DUST • INNERTUBES • GUAYULE • BALATA • NEOPRENE • BUNA S • BUTYL RUBBER • ACETATE •

SCRAP
Rubber Synthetics Plastics

MEYER & BROWN CORP.
Founded 1894
347 Madison Ave., New York 17, N. Y.

• WILD RUBBERS • GUAYULE • NEOPRENE • BUTYL RUBBER • VISTANEX •

SULPHUR and CHEMICALS
for the RUBBER INDUSTRY

CRYSTEX INSOLUBLE SULPHUR
Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure

Carbon Tetrachloride
Caustic Soda
Stauffer CHEMICALS SINCE 1885
Carbon Bisulphide
Sulphur Chloride

STAUFFER CHEMICAL CO.

420 Lexington Avenue, New York 17, N. Y.
221 North LaSalle Street, Chicago 1, Illinois
424 Ohio Bldg., Akron 8, Ohio—Apopka, Fla.
555 South Flower Street, Los Angeles 13, Cal.
636 California Street, San Francisco 8, Cal.
North Portland, Oregon—Houston 2, Texas

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, JULY 14, 1947

Natural Rubber

The downward trend of spot rubber on the Commodity Exchange, evident since the reopening of the Exchange, continued in the past thirty days. The price swung in the range of 375 points, dropping from a high of 17.75c on June 11 to the low for the period of 14.00 on June 24. Some firming up of the price structure has occurred in the past few days, largely on reports of the easing up of natural rubber restrictions. The average price for spot rubber on the Exchange for the month of June was 16.29, based on 21 trading days.

Rubber trading circles were somewhat encouraged by the statement issued by the International Rubber Study Group at the conclusion of its recent meeting at Paris. Although no conclusive decisions were announced, the statement indicated that rubber would be treated as a world-wide commodity and the various governments would be requested to cooperate to the end that synthetic would not be played off against the natural product to keep prices at too low an ebb. It was also intimated that a drive to increase the over-all consumption of rubber would soon be made.

The latest Commerce Department figures indicate that 95,961 tons of rubber were exported from Malaya in May, of which the United States received 51,084 tons. For the first five months of 1947 Malaya exported 401,118 tons, of which 166,138 tons went to the United States. Official Netherlands shipments are still insignificant. Today's quotations in the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.15
July-September	.14⅞
October-December	.14¾
Thick or Thin Latex Crepe:	
Spot	.26
July	.26
Thin Brown Crepe, No. 2	.12¾
Ambers, No. 3	.12¾
Flat Bark Crepe	.11¾

London Market

(Standard Smoked Sheets)

August-September	—— - 14.69
October-December	14.69 - 14.90
January-March	14.79 - 15.00

Singapore Market

(Standard Smoked Sheets)

July	13.40 - 13.53

Synthetic Rubber

(Dry Types)

Butaprene NXM	.470 - .495
Chemigum 30 N4NS	.400 - .470
Chemigum 50 N4NS	.400 - .470
Chemigum N3	.450 - .520
Hycar OR-25	.400 - .425
Hycar OR-15	.470 - .495
Hycar OS-10	.400 - .425
Neoprene Type E	—— - .650
Neoprene Types CG and AC	—— - .500
Neoprene Types FR and KNR	—— - .750
Neoprene Type S	—— - .320
Neoprene Type NC	—— - .250
Perbunan 18	.390 - .415
Perbunan 26	.400 - .425
Perbunan 35	.470 - .495
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol Type ST	.750 - .850
Thiokol PR-1	.750 - .850

Scrap Rubber

The lack of any real demand for scrap rubber, according to dealers, is now well into its sixth month, and there are few takers for offers at any price. Reclaimers are said to be heavily overstocked on supplies and it may be two or three months before they are back in the market. Although the export market furnished some relief to scrap dealers, the shortage of dollars abroad has stymied this market considerably. The uncertainty of further extension of U. S. credits is also crippling export possibilities. Prices shown below are those in effect several months ago:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$18.00
Beadless truck tires	ton	24.00
Mixed truck tires	ton	18.00
Beadless passenger tires	ton	24.00
No. 1 passenger peelings	ton	50.00
No. 1 truck peelings	ton	50.00
No. 2 passenger tubes	lb.	.07½
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06½
Mixed passenger tubes	lb.	.06½
No. 2 truck tubes	lb.	.07¼
Red truck tubes	lb.	.07
Black truck tubes	lb.	.07
Buffings	ton	18.00

Cotton Tire Fabrics

Standard, Peeler, 12/4/2	lb.	.7400
Standard, Peeler, 14/4/2	lb.	.7600
Standard, Peeler, 16/4/3	lb.	.7850
Extra Staple, Peeler, 12/4/	lb.	.8375
Extra Staple, Peeler, 14/4/2	lb.	.8575
Extra Staple, Peeler, 16/4/3	lb.	.8825

Chafers

14.4 oz. (per sq. yard)	lb.	.7150
9.25 oz. (per sq. yard)	lb.	.7450
11.65 oz. (per sq. yard)	lb.	.6450
8.9 oz. (per sq. yard)	lb.	.6900

Cotton

The price of middling uplands on the Cotton Exchange has swung in the wide range of 248 points since our last report (June 10), high for the period being 39.43 on July 11 and low 36.95 on July 7. The average price of middling uplands for the month of June was 37.83, based on 21 trading days. After fluctuating erratically during the first three weeks of the period, cotton prices skyrocketed during the last week, with the spot price on July 11 reaching 39.43, 21 points above the peak for the season, which previously had been set early in October, 1946. The rapid rise in prices was attributed to the small acreage report issued by the Department of Agriculture on July 8. The report indicated that cotton acreage in cultivation in this country as of July 1 was 21,389,000 acres. Quotations for middling uplands on the Exchange follow:

	June 10	July 14		
	Close	High	Low	Close
October	30.86	34.59	33.90	33.90
December	29.77	33.72	33.11	33.11
March	——	33.14	32.65	32.65

Reclaimed Rubber

Tires

Black, Acid	lb.	.08¾ @	.09¼
Black, Digester	lb.	.08 @	.08½
Peels	lb.	.09 @	.09½
GR-S Whole Tire	lb.	.08½ @	.09

Inner Tubes

Black	lb.	.12¾ @	.13¼
Red	lb.	.13½ @	.14
GR-S	lb.	.09½ @	.10
Butyl	lb.	.08½ @	.09

Shoe

Unwashed	lb.	.08¾ @	.08¾

Closing Rubber Prices on New York Commodity Exchange

No. 1 Standard Contract of 10 Tons

FROM JUNE 11 TO JULY 14

	Spot	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sales
June														
11	17.75	16.55	16.50	16.45	16.40	16.35	16.30	16.25	16.17	16.10	16.05	16.00	15.95	35
12	17.25	16.25	16.15	16.10	16.00	15.95	15.90	15.90	15.83	15.75	15.70	15.65	15.60	13
13	16.75	16.08	16.00	15.85	15.81	15.75	15.65	15.60	15.53	15.45	15.40	15.35	15.30	33
14	——	——	——	——	——	——	——	——	——	——	——	——	——	——
15	——	——	——	——	——	——	——	——	——	——	——	——	——	——
16	16.38	16.10	16.06	16.03	16.01	15.95	15.85	15.75	15.68	15.60	15.55	15.50	15.45	24
17	16.38	16.10	16.06	16.03	16.00	15.95	15.85	15.75	15.68	15.60	15.55	15.50	15.45	11
18	16.63	16.15	16.12	16.09	16.05	15.95	15.85	15.80	15.73	15.65	15.60	15.55	15.50	10
19	16.38	16.00	15.90	15.83	15.72	15.70	15.65	15.60	15.53	15.45	15.40	15.35	15.30	13
20	15.88	15.60	15.57	15.53	15.35	15.43	15.35	15.30	15.23	15.15	15.10	15.05	15.00	12
21	——	——	——	——	——	——	——	——	——	——	——	——	——	——
22	——	——	——	——	——	——	——	——	——	——	——	——	——	——
23	15.63	14.90	14.87	14.85	14.80	14.70	14.55	14.45	14.40	14.35	14.30	14.25	14.20	51
24	14.00	13.50	13.50	13.50	13.50	13.45	13.50	13.49	13.49	13.49	13.49	13.49	13.49	87
25	14.00	13.50	13.45	13.40	13.35	13.30	13.25	13.20	13.20	13.20	13.20	13.20	13.20	87
26	14.13	13.70	13.67	13.64	13.60	13.57	13.54	13.50	13.45	13.45	13.45	13.45	13.45	53
27	14.25	13.80	13.83	13.87	13.90	13.93	13.97	14.00	14.03	14.05	14.10	14.15	14.15	66
28	——	——	——	——	——	——	——	——	——	——	——	——	——	——
29	——	——	——	——	——	——	——	——	——	——	——	——	——	——
30	14.50	14.20	14.20	14.20	14.25	14.30	14.35	14.35	14.40	14.45	14.48	14.50	14.55	25
July														
1	14.38	14.15	14.13	14.10	14.10	14.14	14.17	14.20	14.25	14.30	14.32	14.35	14.40	47
2	14.75	14.55	14.57	14.60	14.60	14.67	14.69	14.70	14.75	14.80	14.83	14.85	14.87	35
3	14.75	14.65	14.67	14.72	14.75	14.80	14.83	14.85	14.90	14.95	14.98	15.00	15.02	58
4	——	——	——	——	——	——	——	——	——	——	——	——	——	——
5	——	——	——	——	——	——	——	——	——	——	——	——	——	——
6	——	——	——	——	——	——	——	——	——	——	——	——	——	——
7	14.68	14.30	14.33	14.36	14.40	14.43	14.46	14.50	14.55	14.60	14.62	14.65	14.67	32
8	14.25	13.90	13.94	13.98	14.05	14.00	14.00	14.00	14.00	14.05	14.05	14.05	14.05	81
9	14.25	14.10	14.07	14.03	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	83
10	14.50	14.15	14.14	14.12	14.10	14.10	14.10	14.10	14.10	14.10	14.10	14.10	14.10	65
11	14.50	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	95
12	——	——	——	——	——	——	——	——	——	——	——	——	——	——
13	——	——	——	——	——	——	——	——	——	——	——	——	——	——
14	14.75	14.75	14.75	14.75	14.75	14.75	14.77	14.79	14.79	14.79	14.79	14.79	14.79	49

CHARLES T. WILSON CO., INC.

120 WALL ST., NEW YORK 5, N. Y.

★

Plantation and Wild Rubbers

Synthetic Rubbers

Liquid Latex

Balatas, Guayule, Gums

★

Distributor of

GR-S Synthetic Latices

BY APPOINTMENT OF OFFICE OF RUBBER RESERVE

BRANCHES AND SALES REPRESENTATIVES

Charles T. Wilson Co., Inc., United Bldg., Akron, Ohio
Ernest Jacoby & Co., 79 Milk St., Boston, Mass.
Reinke & Amende, Inc., 1925 East Olympic Blvd., Los Angeles, Cal.
Charles T. Wilson Company (Canada) Ltd., 406 Royal Bank Building, Toronto, Canada

REVERTEX CORPORATION OF AMERICA

274 Ten Eyck Street
Brooklyn 6. N. Y.

Distributors for RUBBER RESERVE CO. of

GR-S LATEX

CONCENTRATED GR-S LATEX (58%)

COMPOUNDS FROM SYNTHETIC LATICES

Agents of Rubber Reserve Co.

for

REVERTEX (73-75%)

60% LATEX

NORMAL LATEX

We maintain a fully equipped laboratory and free consulting service

Trade Mark

HEVEATEX

CORPORATION

78 GOODYEAR AVENUE

MELROSE 76, MASS.

BRANCHES: CHICAGO, ILL. AKRON, O. DETROIT, MICH. LOS ANGELES, CAL.

Natural and Synthetic

Latex and Latex Compounds

for all purposes

STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS												
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule				RE-EXPORTS		TOTAL NET IMPORTS
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,694	745,873	12.36	600,479	7,902	3,385,433	592,577
1938	397,620	125,357,730	14.07	11,878	4,147,318	15.59	2,485	623,819	11.21	411,983	5,652	1,799,124	406,331
1939	469,803	167,558,245	15.92	27,438	10,467,552	17.03	2,232	463,345	9.27	499,473	13,125	5,832,618	486,348
1940	780,820	303,117,726	17.33	33,789	14,593,466	19.28	3,634	758,007	9.31	818,243	7,060	3,197,136	811,183
1941	989,329	401,890,392	18.14	34,798	15,965,627	20.48	4,881	1,145,767	10.48	1,029,008	5,376	2,757,872	1,023,632
1942	265,980	112,377,896	18.86	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,149	10,856	5,913,386	271,293
1943	30,348	31,364,033	27.81	1,890	1,312,202	30.99	7,679	3,636,789	21.14	59,917	22,587	16,446,707	37,330
1944	103,820	73,908,389	31.78	3,091	2,092,211	30.22	6,700	3,351,233	22.33	113,611	9,739	8,712,695	103,872
1945	134,454	95,850,441	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,267	9,509	7,201,746	139,758
1946	366,415	222,552,939	27.12	8,421	5,843,085	30.98	5,344	2,859,246	23.89	380,180	7,711	5,331,954	372,469
1943:													
July	9,568	6,973,890	32.54	336	219,469	29.15	605	371,245	27.39	10,509	620	455,658	9,889
Aug.	9,741	6,880,325	31.53	624	407,677	29.15	841	506,655	26.91	11,206	894	824,976	10,312
Sept.	9,870	7,050,795	31.89	626	408,651	29.15	668	409,535	27.38	11,164	406	310,128	10,758
Oct.	10,673	7,645,618	31.98	287	187,422	29.15	646	391,971	27.07	11,606	562	369,296	11,044
Nov.	11,177	7,844,162	31.33	296	193,252	29.15	739	446,925	27.65	12,212	254	179,321	11,958
Dec.	12,844	9,273,507	32.24	382	248,604	29.15	819	498,604	27.20	14,045	525	349,385	13,520
1946:													
Jan.	18,580	13,515,971	32.48	569	371,857	29.15	446	263,279	26.33	19,595	164	41,992	19,431
Feb.	32,690	20,944,266	32.70	....	.....	....	318	171,823	24.10	33,008	723	444,400	32,285
Mar.	31,093	22,520,391	32.33	504	328,905	29.15	160	87,344	24.34	31,757	714	488,044	31,043
Apr.	26,234	18,997,757	32.33	1,001	808,463	36.06	874	467,151	23.86	28,109	392	243,952	27,717
May	4,784	3,314,818	30.93	1,052	687,100	29.11	430	219,830	22.82	6,266	422	419,278	5,844
June	8,518	6,132,895	32.15	561	366,165	29.15	466	244,580	23.41	9,545	460	446,253	9,085
July	20,641	13,947,817	30.17	696	451,523	28.96	291	148,442	22.85	21,628	2,457	1,600,600	19,171
Aug.	34,125	18,656,966	24.41	1,231	803,435	29.14	366	193,680	23.06	35,722	1,515	902,005	34,207
Sept.	41,311	22,317,275	24.12	....	.....	....	425	219,849	23.09	.....	145	81,481	.....
Oct.	45,523	24,745,403	24.27	672	438,938	29.15	691	377,319	24.38	46,886	649	613,424	46,237
Nov.	58,756	30,648,620	23.29	130	85,363	29.24	379	200,270	23.58	59,265	60	29,800	59,205
Dec.	44,159	23,810,760	23.87	2,005	1,501,336	33.43	494	265,679	24.02	46,658	17	20,625	46,641
1947:													
Jan.	92,459	51,035,472	24.64	....	.....	....	315	169,081	23.65	.....	20	16,644	.....
Feb.	57,771	30,580,942	23.63	2,426	1,550,499	28.52	481	256,760	23.84	60,678	1,991	1,149,953	58,687
Mar.	35,128	19,421,550	24.46	496	324,103	29.15	463	246,573	23.76	36,087	39	23,592	36,048
Apr.	45,453	23,627,600	23.21	34	26,754	34.84	524	282,941	24.09	46,011	26	20,725	45,985

Source: U. S. Department of Commerce.
Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule.

Natural Rubber
(Including Latex and Guayule)
(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	488,145	575,000	12,581	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1945:				
July	8,739	7,698	756	103,504
Aug.	10,259	7,392	777	105,594
Sept.	12,150	5,799	560	111,385
Oct.	13,984	7,206	78	118,085
Nov.	7,288	7,575	255	117,543
Dec.	7,884	8,185	92	118,715
1946:				
Jan.	25,143	10,355	209	133,294
Feb.	35,104	10,131	290	157,977
Mar.	35,348	12,792	445	180,088
Apr.	19,847	16,914	190	182,831
May	6,126	17,867	327	170,763
June	23,382	16,466	911	176,768
July	14,942	21,998	222	169,490
Aug.	45,087	28,405	592	185,580
Sept.	46,122	31,123	988	199,591
Oct.	36,735	35,421	106	200,799
Nov.	55,231	37,323	35	218,672
Dec.	57,620	38,802	23	237,467
1947:				
Jan.	102,080	45,328	28	294,191
Feb.	30,318	40,983	47	283,479
Mar.	40,437	43,104	....	280,812
Apr.	55,976	43,818	....	292,970
May	81,909	43,098	....	331,781

Source: 1936-40, U. S. Department of Commerce; 1941 to date, Civilian Production Administration.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.
(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1945:						
June	8	6,872	....	.....	....	.....
July	228	128,129	....	.....	....	.....
Aug.	154	80,296	....	.....	....	.....
Sept.	49	52,148	....	.....	5	2,196
Oct.	130	83,173	....	.....	....	.....
Nov.	303	257,246	....	.....	10	6,547
Dec.	48	58,742	....	.....	18	9,983
1946:						
Jan.	129	121,228	....	.....	....	.....
Feb.	38	35,699	....	.....	5	2,178
Mar.	100	70,315	....	.....	....	.....
Apr.	362	261,098	....	.....	....	.....
May	325	212,899	....	.....	....	.....
June	80	80,006	....	.....	....	.....
July	219	178,564	115	91,412	7	19,839
Aug.	234	249,380	....	.....	4	13,438
Sept.	159	161,937	4	9,337	23	47,147
Oct.	282	367,393	21	29,307	305	216,901
Nov.	152	270,379	28	39,502	3	10,233
Dec.	199	287,167	57	41,757	26	52,096
1947:						
Jan.	183	252,580	37	29,087	36	71,252
Feb.	270	300,828	36	44,629	17	39,679
Mar.	137	158,530	190	112,132	21	28,898
Apr.	85	106,783	178	86,923	31	48,178

Source: U. S. Department of Commerce.

NEW YORK

SOUTH ASIA CORP.
80 BROAD STREET
NEW YORK 4, N. Y.
WHitehall 4-8907

CRUDE RUBBER

Balatas — Gums — Guayule

Synthetic Rubber

Liquid Latex

AKRON

E. P. LAMBERT CO.
FIRST NATIONAL TOWER
AKRON 8, OHIO
HEmlock 2188

HW & CO

HERMANN WEBER & CO., Inc.
76 BEAVER STREET
NEW YORK 5, N. Y.

T-C

Dealers and Brokers

All Grades

Scrap Rubber

•

Synthetic Scrap

•

Plastic Scrap

TANNEY-COSTELLO
INC.

CABLE ADDRESS "COSTAN" AKRON

P. O. BOX 1112
868 E. TALLMADGE AVE.
AKRON 9, OHIO

Synthetic Rubber

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702†
1942	22,434	.....	17,651	1,419	4,612†
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699*	72,920	114,963
1945:					
Nov.	48,634	471	56,227	7,984	214,289
Dec.	46,593	473	56,112	5,341	203,454
1946:					
Jan.	56,089	.....	66,993	5,715	177,051
Feb.	51,848	.....	63,770	6,415	144,427
Mar.	60,363	1,429	74,214	17,707	115,310
Apr.	66,014	536	70,703	12,878	101,510
May	66,044	366	70,914	13,102	93,447
June	63,388	415	62,899	5,161	94,095
July	63,176	353	54,562	3,175	101,007
Aug.	64,300	634	61,486	2,175	103,076
Sept.	63,765	1,031	58,798	2,480	108,840
Oct.	62,086	1,149	60,729	474	110,913
Nov.	60,305	894	57,794	1,781	113,556
Dec.	62,648	902	53,453	1,857	114,963
1947:					
Jan.	62,103	0	58,764	3,359	115,655
Feb.	59,125	0	53,321	2,166	119,912
Mar.	57,478	0	55,514	704	121,322
Apr.	50,117	4	54,333	357	116,829
May	39,069	0	48,663	437	106,848

Source: Civilian Production Administration.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. * Includes year-end adjustment of 5,384 tons to cover non-reporting companies. † Does not include Buna N types.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1942	3,721	8,956	23	9,734	22,434
1943	182,259	33,603	1,373	14,487	231,722
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735

Consumption

1942	2,579	6,833	22	8,217	17,651
1943	131,977	26,205	304	12,405	170,891
1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699

Exports

1942	222	1,037	.....	160	1,419
1943	14,937	2,540	40	631	18,148
1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	1,020	72,920

Stocks at End of Period

1942	1,050	1,786	4	1,772	4,612
1943	30,975	6,415	1,035	3,143	41,568
1944	116,130	11,739	9,892	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,532	114,963

Source: Civilian Production Administration.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1940	1941	1942	1943	1944	1945	1946	1947
Jan.	40,370	46,190	49,216	36,085	47,540	52,008	51,186	57,119
Feb.	37,557	42,782	42,666	36,274	47,754	48,856	47,889	50,551
Mar.	44,607	49,572	50,820	41,586	52,263	55,364	56,801	59,947
Apr.	47,683	55,879	49,554	48,177	50,005	59,024	62,045	64,140
May	52,946	60,121	53,212	49,828	54,230	60,748	66,774	.....
June	53,459	59,062	50,077	52,325	54,266	60,580	63,221	.....
July	53,865	63,906	54,606	49,867	55,119	66,170	69,044	.....
Aug.	55,346	63,575	48,793	51,880	55,616	70,058	66,701	.....
Sept.	52,297	59,768	50,093	49,707	56,318	64,529	62,216	.....
Oct.	53,807	58,412	50,094	53,111	53,154	55,708	66,598	.....
Nov.	49,074	54,670	50,729	50,703	54,967	53,543	61,315	.....
Dec.	46,413	53,568	39,250	48,695	52,250	49,745	61,043	.....
Total	589,424	667,505	589,110	568,238	633,482	696,333	734,833	.....

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude [a]	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007[b]	254,820	64.6	30,405	42,532
1943	304,058[c]	291,082	59.6	15,678	46,201
1944	260,631[d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1945:					
Sept.	17,246	17,365	33.9	1,323	32,439
Oct.	22,044	22,185	33.7	1,195	31,103
Nov.	20,560	20,263	31.8	859	30,541
Dec.	20,632	19,590	30.5	1,391	28,155
1946:					
Jan.	24,458	22,031	28.5	1,253	29,099
Feb.	23,187	20,702	28.0	1,368	30,216
Mar.	25,136	22,075	26.0	1,841	31,436
Apr.	23,930	22,396	25.8	1,238	31,732
May	25,322	22,162	24.9	1,338	33,554
June	24,882	21,725	27.4	1,416	35,295
July	22,619	21,350	27.9	961	35,603
Aug.	25,798	24,566	27.3	1,093	35,742
Sept.	23,956	23,715	26.4	579	35,404
Oct.	26,322	26,706	27.7	759	34,261
Nov.	24,748	24,385	25.6	1,108	33,516
Dec.	25,254	23,597	25.6	1,507	33,666
1947:					
Jan.	25,545	27,715	26.6	1,443	30,053
Feb.	23,990	25,484	27.3	1,142	27,417
Mar.	26,209	26,157	26.8	1,268	31,940
Apr.	26,696	25,066	25.5	1,073	33,527
May	25,392	21,697	23.6	1,271	37,223

Source: 1936-40, Department of Commerce; 1941 to date, Civilian Production Administration.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1930	2,784,745	571,241	3,355,986	1938	2,000,985	485,852	2,486,837
1931	1,973,090	416,648	2,389,738	1939	2,866,796	704,308	3,571,104
1932	1,135,491	235,187	1,370,678	1940	3,692,328	721,637	4,413,965
1933	1,573,512	346,545	1,920,057	1941	3,744,300	875,381	4,619,681
1934	2,177,919	575,192	2,753,111	1942	220,814	133,083	353,897
1935	3,252,244	694,690	3,946,934	1943	0	4,501	4,501
1936	3,669,528	781,862	4,451,390	1944	0	124,819	124,819
1937	3,915,889	892,382	4,808,271	1945	83,792	313,643	397,435
				1946	2,148,677	930,739	3,079,416
1946							
Jan.	56,367	45,033	101,400	July	209,180	87,454	296,634
Feb.	57,784	34,914	92,698	Aug.	247,261	97,881	345,142
Mar.	85,810	37,636	123,446	Sept.	232,280	95,658	327,938
Apr.	132,631	80,762	213,393	Oct.	283,586	107,154	390,740
May	166,942	75,373	242,315	Nov.	269,081	100,892	369,973
June	141,090	60,038	201,128	Dec.	266,665	107,616	374,281
1947							
Jan.	246,605	99,818	346,423	July	.....	.....	.....
Feb.	267,015	105,042	372,057	Aug.	.....	.....	.....
Mar.	301,525	118,234	419,759	Sept.	.....	.....	.....
Apr.	314,765	106,984	421,749	Oct.	.....	.....	.....
May	284,357	96,430	380,787	Nov.	.....	.....	.....
June	.....	.....	.....	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.

Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1941	1942	1943	1944	1945	1946
Passenger Car	17,828,994	1,025,880	780,291	1,748,917	4,504,368	15,058,469
Truck & Bus	6,464,725	5,298,603	4,949,004	6,391,441	6,486,652	5,939,244
Agricultural	1,576,720	194,900	301,997	997,301	1,441,909	1,735,992
Earth Mover	2,593	1,814	945	703	1,308	5,520
Total	25,873,032	6,521,197	6,032,237	9,138,362	12,434,237	22,739,225

	1947 Jan.	Feb.	Mar.	Apr.	May	June
Passenger Car	1,621,532	1,547,429	1,771,916	1,897,028	1,741,355	1,758,848
Truck & Bus	783,872	714,896	680,812	622,767	672,092	627,300
Agricultural	205,260	226,614	202,633	324,125	208,337	206,843
Earth Mover	237	185	228	2,472	.....	611
Total	2,610,901	2,489,124	2,655,589	2,846,392	2,621,784	2,593,602

Source: The Tire & Rim Association, Inc.

ERNEST JACOBY & CO.

Crude Rubber — *Liquid Latex*
Crown Rubber Clay — *Carbon Black*
Rubber Chemicals — *Rubber Colors*

Stocks of above carried at all times

BOSTON - 79 Milk St. - MASS.

Cable Address: Jacobite Boston

Carey MAGNESIA

OXIDES AND CARBONATES LIGHT AND HEAVY—FOR TECHNICAL & DRUG USES

The knowledge and experience of Carey Research Laboratories in using these products in chemical formulations are available upon request.

THE PHILIP CAREY MFG. COMPANY
Cincinnati 15, Ohio
BRANCHES OR DISTRIBUTORS IN ALL PRINCIPAL CITIES

MICA

WATERGROUND WHITE and BIOTITE MICAS—Used for over 35 years in the Rubber Industry

The English Mica Co.
220 E 42nd St., NEW YORK 17

SOFTENERS and PLASTICIZERS
For RUBBER
From the Pine Tree

ROSIN OIL
PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" Booklet

NATIONAL ROSIN OIL & SIZE CO.
R. K. O. BUILDING, RADIO CITY, NEW YORK, N. Y.
Plant Savannah, Ga. Branches in Principal Cities
PIONEERS OF THE INDUSTRY

Vulcanized VEGETABLE OILS

· RUBBER SUBSTITUTES ·

Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.

THE CARTER BELL MFG. CO.
SINCE
CARTER BELL PRODUCTS
1903
SPRINGFIELD, NEW JERSEY

A LONG ESTABLISHED AND PROVEN PRODUCT

Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1935 (total)	19,263	29,406	1,514	50,183	49,362	8,196
Passenger Car	17,063	26,036	948	44,047	43,256	7,054
Truck and Bus	2,200	3,370	566	6,136	6,106	1,142
1936 (total)	21,446	30,866	1,073	53,385	56,041	10,717
Passenger Car	18,941	26,999	644	46,584	49,013	9,291
Truck and Bus	2,505	3,867	429	6,801	7,028	1,426
1937 (total)	22,353	29,886	1,246	53,485	53,310	10,383
Passenger Car	20,055	26,177	696	46,928	46,497	8,745
Truck and Bus	2,298	3,709	550	6,557	6,813	1,638
1938 (total)	11,516	30,567	1,049	43,132	40,907	8,451
Passenger Car	10,086	27,104	580	37,770	35,789	6,937
Truck and Bus	1,430	3,463	469	5,362	5,118	1,514
1939 (total)	18,208	38,022	1,279	57,509	57,613	8,665
Passenger Car	15,742	33,471	607	49,820	49,933	7,108
Truck and Bus	2,466	4,551	672	7,689	7,680	1,557
1940 (total)	22,252	35,346	1,176	58,774	59,186	9,127
Passenger Car	19,560	30,903	411	50,874	50,965	7,270
Truck and Bus	2,692	4,443	765	7,900	8,221	1,857
1941 (total)	24,780	39,895	1,489	66,164	61,540	4,436
Passenger Car	19,855	34,119	586	54,560	50,392	3,165
Truck and Bus	4,925	5,776	903	11,604	11,148	1,271
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947:						
January (total)	1,922	5,364	213	7,499	8,508	3,328
Passenger Car	1,422	4,529	109	6,060	6,889	2,477
Truck and Bus	500	835	104	1,439	1,619	851
February (total)	2,138	5,016	206	7,360	7,915	3,865
Passenger Car	1,606	4,240	93	5,939	6,429	2,949
Truck and Bus	532	776	113	1,421	1,486	916
March (total)	2,457	5,142	293	7,892	8,577	4,516
Passenger Car	1,875	4,343	152	6,371	6,973	3,518
Truck and Bus	582	799	141	1,521	1,604	998
April (total)	1,894	5,063	316	7,273	8,333	5,608
Passenger Car	1,464	4,241	155	5,859	6,711	4,400
Truck and Bus	430	822	161	1,414	1,622	1,208

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton				Rayon and Nylon [b]		
	Tire Cord Not Woven	Cord Fabric Woven	Chafer and All Other Tire Fabrics	Total	Tire Cord Not Woven	Tire Cord And Other Tire Fabrics	Total
1943:							
Jan.-Mar.	11,155	34,287	7,819	53,261	564	9,833	10,397
Apr.-June	11,625	34,684	8,549	54,858	1,253	10,185	11,438
July-Sept.	15,754	36,854	9,618	62,226	1,220	9,184	10,404
Oct.-Dec.	15,928	42,639	10,464	69,031	1,806	12,055	13,861
Total	54,462	148,464	36,450	239,376	4,843	41,257	46,100
1944:							
Jan.-Mar.	17,135	42,783	11,452	71,370	1,812	15,830	17,642
Apr.-June	17,587	40,580	11,499	69,666	1,353	19,586	20,939
July-Sept.	16,653	38,462	11,055	66,170	1,299	25,915	27,214
Oct.-Dec.	12,982	34,107	10,948	58,037	2,773	33,630	36,403
Total	64,357	155,932	44,954	265,243	7,237	94,961	102,198
1945:							
Jan.-Mar.	16,671	43,835	12,306	72,812	3,726	37,777	41,503
Apr.-June	16,044	42,383	13,604	72,031	4,064	42,476	46,540
July-Sept.	15,136	38,158	14,122	67,416	3,549	42,606	46,155
Oct.-Dec.	15,514	36,442	13,573	65,529	a	47,734	47,734
Total	63,365	160,818	53,605	277,788	11,339	170,593	181,932
1946:							
Jan.-Mar.	17,128	39,377	15,245	71,750	a	51,208	51,208
Apr.-June	19,622	40,197	18,623	78,442	a	52,511	52,511
July-Sept.	17,279	39,259	18,787	75,325	5,102	46,932	52,034
Oct.-Dec.	20,660	42,668	21,708	85,036	5,858	50,589	56,447
Total	74,689	161,501	74,363	310,553	10,960	201,240	212,200

Source: U. S. Bureau of the Census.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1935	19,218	28,095	754	48,067	47,879	8,231
1936	21,514	32,188	721	54,423	57,036	10,945
1937	22,464	29,554	749	52,767	52,373	10,312
1938	11,515	28,134	644	40,293	37,848	8,166
1939	18,190	31,998	1,002	51,190	50,649	7,036
1940	22,172	29,070	972	52,214	52,237	7,017
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	n.a.	n.a.	n.a.	13,958	12,568	5,742
1943	6,183	12,373	176	18,732	15,260	2,584
1944	6,461	19,739	190	26,390	26,750	2,823
1945	6,119	33,161	408	39,688	41,102	3,671
1946	15,327	59,357	1,424	76,108	77,251	3,820
1946:						
Nov.	1,659	5,334	172	7,165	7,643	4,365
Dec.	1,842	6,130	191	8,163	7,550	3,903
1947:						
Jan.	1,922	5,085	181	7,188	8,720	5,075
Feb.	2,129	3,988	171	6,289	7,841	6,621
Mar.	2,460	3,740	266	6,466	7,921	8,050
Apr.	1,897	3,510	324	5,731	7,093	9,480

Source: The Rubber Manufacturers Association, Inc.
n.a.—Not available.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1910	288	141	206.60	1929	26⅜	15½	20.55
1911	184	114	141.30	1930	16½	7½	11.98
1912	140	108	121.60	1931	8⅝	4¼	6.17
1913	113	59	82.04	1932	4¾	2½	3.49
1914	93	56	65.33	1933	9⅞	2⅜	5.96
1915	79	58½	65.85	1934	15⅜	8¾	12.92
1916	102	55	72.50	1935	13¾	10½	12.37
1917	90	52	72.23	1936	23	13½	16.41
1918	70	40	60.15	1937	26⅛	14	19.39
1919	57	38½	48.70	1938	17⅞	10⅛	14.64
1920	56½	16	36.30	1939	24	14⅛	17.57
1921	21¾	11½	16.36	1940	24	18¾	20.10
1922	28¾	13¾	17.50	1941	24⅞	19½	22.40
1923	37⅛	24¾	29.45	1942	22½	22½	22.50
1924	40½	17¾	26.20	1943	22½	22½	22.50
1925	121	34⅜	72.46	1944	22½	22½	22.50
1926	88½	36¾	48.50	1945	22½	22½	22.50
1927	41¾	33	37.72	1946	22½	22½	22.50
1928	41¾	17	22.48				

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1940	1941	1942	1943	1944	1945	1946	1947
Jan.	11.19	10.66	19.85	21.34	20.76	22.36	25.49	32.58
Feb.	11.10	10.87	20.05	21.61	21.34	22.29	26.57	33.91
Mar.	10.90	11.08	20.42	21.98	21.65	22.43	27.52	35.89
Apr.	10.89	11.48	21.10	22.02	21.71	21.88	28.40	35.89
May	10.33	12.97	20.88	21.97	21.63	23.30	28.17	36.51
June	10.72	14.66	19.78	21.92	22.31	23.42	29.89	37.83
July	10.42	16.55	20.27	21.46	22.33	23.27	34.11	....
Aug.	9.84	17.06	19.45	21.09	22.11	23.10	36.31	....
Sept.	9.69	17.94	19.62	21.10	22.10	23.25	37.59	....
Oct.	9.62	17.31	19.79	21.00	22.32	23.85	36.79	....
Nov.	9.97	17.21	20.21	20.32	22.13	24.71	31.50	....
Dec.	10.18	18.09	20.55	20.32	22.28	25.21	33.03	....
Average for Year	10.40	14.66	20.16	21.34	21.89	23.25	31.28	....

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film [a]	Textile and Paper Coating Resins [b]	Molding and Extrusion Materials [b]	All Other [b, c]
1946	52,080	11,673	61,852	27,083
1947:				
Jan.	6,197	1,237	6,802	3,097
Feb.	5,131	892	5,345	2,255
Mar.	5,853	1,142	6,922	3,081
Apr.	5,981	1,425	6,890	2,021
May	4,431	1,432	5,777	1,486
June	....	....	....	....
July	....	....	....	....
Aug.	....	....	....	....
Sept.	....	....	....	....
Oct.	....	....	....	....
Nov.	....	....	....	....
Dec.	....	....	....	....

Source: Bureau of the Census.
Notes: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting; (b) Resin content; (c) Includes Adhesives, but excludes data for protective coating resins.

Announcing

ADPOL

A Rubber Cement for Adhering

NYLON and

FIBRE-GLASS

ADHESIVE PRODUCTS

CORPORATION

1660 Boone Ave. New York 60, N. Y.

(Established 1895)

COLORS for RUBBER

Red Iron Oxides

Green Chromium Oxides

Green Chromium Hydroxides

•

Reinforcing Fillers and Inerts

C. K. WILLIAMS & CO.

EASTON, PA.

BUTENE POLYMERS

for data, write to

ADVANCE SOLVENTS & CHEMICAL CORPORATION

245 FIFTH AVENUE NEW YORK 16, N. Y.

GRANULATED CORK

PROCESSED TO SPECIFICATION

MARYLAND CORK COMPANY, INC.

1528 Munsey Bldg. Baltimore 2, Md.

RMP

for RED RUBBER

ANTIMONY

• ATTRACTIVE

• NON-DETERIORATING

RARE METAL PRODUCTS CO.

ATGLEN, PA.

safeguard against dust

here's a non-foaming

ANTI ADHESIVE

IN LIQUID FORM...

TEXOLUBE-R

Applied by spray, dipping or brushing TEXOLUBE-R forms a continuous unbroken coating. Even when spray applied, there is no danger of bubbles, surface breaks or unprotected areas. TEXOLUBE-R is easier to handle and easier to use. Forty percent solid content . . . shipped as a fluid concentrate, not a paste, it is always ready for use . . . always easily and accurately measured and mixed.

TEXOLUBE-R produces a "tack-proof," exceptionally tough, transparent film on all types of rubber, and has no harmful effect in any subsequent operations.

Send for free gallon sample or full drum on ten day trial basis.

THE TEXO CORP.

DANA & FLORAL

CINCINNATI 7, OHIO

TEXO

Rubber Industry Employment, Payrolls, Wages and Hours

Employment — Thousands of Production Workers and Index (1939 = 100)

Month	1946 All Rubber Products Number	1946 All Rubber Products Index	1946 Rubber Tires & Tubes Number	1946 Rubber Tires & Tubes Index	1947 All Rubber Products Number	1947 All Rubber Products Index	1947 Rubber Tires & Tubes Number	1947 Rubber Tires & Tubes Index
Jan.	209	172.7	99	182.4	240	198.8	110	203.5
Feb.	214	177.1	101	187.3	240	198.2	109	201.2
Mar.	220	181.5	104	191.6	238	196.5	108	199.1
Apr.	217	179.1	104	192.8	233	193.0	...	....
May	217	179.7	105	193.4	...	....	...	....
June	221	182.9	106	195.8	...	....	...	....
July	214	177.0	99	183.1	...	....	...	....
Aug.	223	184.0	103	189.9	...	....	...	....
Sept.	229	189.1	107	197.0	...	....	...	....
Oct.	236	194.8	110	204.0	...	....	...	....
Nov.	240	198.8	112	207.0	...	....	...	....
Dec.	242	200.1	112	206.3	...	....	...	....

Payrolls — Production Workers Pay Rolls Unadjusted Index (1939 = 100)

Month	1945 All Rubber Products	1945 Rubber Tires & Tubes	1946 All Rubber Products	1946 Rubber Tires & Tubes	1947 All Rubber Products	1947 Rubber Tires & Tubes
Jan.	323.2	342.4	290.1	272.6	386.3	361.2
Feb.	323.6	339.8	292.1	271.9	385.0	357.7
Mar.	315.4	301.9	298.2	281.1	374.3	343.7
Apr.	315.9	306.0	319.7	312.9	....	....
May	299.8	288.6	322.1	314.2	....	....
June	304.3	293.8	331.4	318.3	....	....
July	298.7	286.8	321.4	304.3	....	....
Aug.	231.3	211.4	336.9	311.2	....	....
Sept.	231.3	211.4	363.9	348.9	....	....
Oct.	254.2	239.8	361.3	346.1	....	....
Nov.	257.8	240.2	377.4	360.3	....	....
Dec.	275.5	256.7	392.2	368.9	....	....

Wages — Average Weekly Earnings

Month	1945 All Rubber Products	1945 Rubber Tires & Tubes	1946 All Rubber Products	1946 Rubber Tires & Tubes	1947 All Rubber Products	1947 Rubber Tires & Tubes
Jan.	$54.49	$64.29	$46.71	$50.29	$54.03	$59.78
Feb.	54.40	64.04	46.05	49.21	54.06	59.90
Mar.	50.62	57.29	46.46	49.72	53.01	58.01
Apr.	51.93	59.75	49.67	54.77	....	....
May	50.09	57.32	49.82	54.72	....	....
June	51.45	59.20	50.45	54.82	....	....
July	51.81	59.59	50.60	56.11	....	....
Aug.	46.76	52.81	51.03	55.42	....	....
Sept.	47.20	53.59	53.69	59.89	....	....
Oct.	45.57	49.48	51.74	57.38	....	....
Nov.	44.68	47.78	52.93	58.87	....	....
Dec.	45.48	48.54	54.63	60.46	....	....

Wages — Average Hourly Earnings

Month	1945 All Rubber Products	1945 Rubber Tires & Tubes	1946 All Rubber Products	1946 Rubber Tires & Tubes	1947 All Rubber Products	1947 Rubber Tires & Tubes
Jan.	$1.151	$1.317	$1.121	$1.255	$1.330	$1.511
Feb.	1.149	1.314	1.129	1.266	1.331	1.517
Mar.	1.117	1.260	1.138	1.275	1.331	1.515
Apr.	1.136	1.294	1.232	1.414	....	....
May	1.132	1.284	1.266	1.446	....	....
June	1.140	1.307	1.283	1.461	....	....
July	1.138	1.296	1.292	1.472	....	....
Aug.	1.119	1.269	1.295	1.474	....	....
Sept.	1.098	1.243	1.323	1.507	....	....
Oct.	1.100	1.251	1.313	1.492	....	....
Nov.	1.112	1.249	1.322	1.503	....	....
Dec.	1.113	1.247	1.331	1.513	....	....

Hours — Average Weekly Hours per Worker

Month	1945	1946	1947	Month	1945	1946	1947
January	47.3	41.7	40.6	July	45.5	39.2	...
February	47.3	40.8	40.6	August	41.8	39.4	...
March	45.3	40.8	39.8	September	43.0	40.6	...
April	45.7	40.3	...	October	41.4	39.4	...
May	44.2	39.4	...	November	40.2	40.1	...
June	45.2	39.3	...	December	40.9	41.2	...

Source: U. S. Department of Commerce.

Indexes of Production, Shipments and Inventory For The Rubber Industry

Production 1935-1939 = 100 (Based on man-hours)

Month	1945	1946	1947	Month	1945	1946	1947
Jan.	247	215	247	July	218	211	....
Feb.	247	216	246	Aug.	193	221	....
Mar.	236	221	239	Sept.	172	234	....
Apr.	233	219	235	Oct.	191	234	....
May	224	215	....	Nov.	192	243	....
June	222	218	....	Dec.	205	252	....

Shipments—Average Month 1939 = 100 (Based on $ Value)

Jan.	311	229	290	July	274	268	....
Feb.	351	242	315	Aug.	255	282	....
Mar.	351	260	....	Sept.	200	311	....
Apr.	356	282	....	Oct.	260	333	....
May	333	288	....	Nov.	212	313	....
June	333	293	....	Dec.	292	352	....

Inventory — Average Month 1939 = 100 (Based on $ Value)

Jan.	170.6	173.7	238.0	July	183.3	195.0	....
Feb.	176.7	179.9	250.0	Aug.	182.4	198.0	....
Mar.	175.5	186.4	....	Sept.	177.4	204.0	....
Apr.	175.3	198.5	....	Oct.	167.7	212.0	....
May	178.3	195.5	....	Nov.	167.1	215.0	....
June	178.7	192.4	....	Dec.	169.0	216.0	....

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1940	1941	1942	1943	1944	1945	1946
Asphalt [a]							
Short tons	22,772	20,536	22,263	16,510	20,189	19,483	.....
% of total	0.9	0.6	0.6	0.5	0.6	0.5	.....
Barite (Barytes):							
Short tons	4,283	9,800	6,334	8,000	10,000	10,000	20,000
% of total	2.3	4.2	3.6	3.9	2.9	2.1	4.4
Carbon Black:							
Short tons	155,090	219,751	147,974	236,737	369,015	402,193	470,732
% of total	58.5	68.2	65.8	75.2	78.7	78.9	74.1
Clay, Kaolin:							
Short tons	92,640	127,055	51,334	50,964	59,588	109,936	162,393
% of total	11.1	11.6	5.1	5.5	6.8	11.7	12.3
Clay, Fire & Stoneware:							
Short tons	10,104	9,000	5,000	10,259	7,160	7,800	12,951
% of total	0.4	0.2	0.1	0.2	0.1	0.1	0.2
Lead Sulfate, Basic:							
Short tons	128	200	89	131	268	200	.....
% of total	2.1	1.9	1.1	2.3	4.2	5.2	.....
Lime:							
Short tons	1,879	3,058	1,381	2,039	5,634	7,170	3,193
% of total	0.03	0.05	0.02	0.05	0.13	0.10	0.1
Litharge:							
Short tons	1,590	3,968	3,460	4,302	3,023	1,864	2,131
% of total	1.8	3.3	3.8	3.8	2.2	1.3	1.6
Lithopone:							
Short tons	3,387	3,547	1,047	1,078	726	977	1,607
% of total	2.2	2.0	0.8	0.8	0.5	0.7	1.1
Mica, Ground:							
Short tons	1,731	3,476	1,754	3,063	1,137	3,715	.....
% of total	6.2	8.0	3.7	6.0	2.2	7.0	.....
Sulfur:							
Short tons	54,000	63,000	40,000	51,000	63,000	64,960	72,800
% of total	2.5	2.4	1.4	1.8	1.9	2.0	2.2
Talc [b]							
Short tons	28,501	58,114	40,487	48,994	51,833	62,049	.....
% of total	10.0	13.9	10.0	11.8	13.0	15.0	.....
Zinc Oxide:							
Short tons	70,979	90,429	52,717	67,898	59,518	63,447	83,776
% of total	62.8	63.4	53.0	47.4	42.3	49.6	53.1

Source: U. S. Bureau of Mines.

Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes pyrophyllite and ground soapstone.

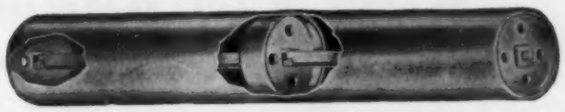
DIC
43 Years in St. Louis

ALL TYPES OF *Sharp Edge* CUTTING DIES

Also an improved, effective hand operated die block scraper.

INDEPENDENT DIE & SUPPLY COMPANY
LaSalle & Ohio Sts. • St. Louis 4, Missouri

New and Better
GAMMETER'S
ALL STEEL ALL WELDED
CALENDER STOCK SHELL



4" - 5" - 6" - 8" - 10" - 12" diameters, any length.

Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

PORTUGAL
REPRESENTATIVE

Agent, experienced in rubber and plastics fields, available to represent United States companies on

RUBBER & PLASTICS CHEMICALS & MACHINERY

A. HENRIQUES & COMPANY, LTD.
founded 1922
S. João Da Madeira, Portugal

GUARANTEED
REBUILT MACHINERY
MILLS, CALENDERS
TUBERS, VULCANIZERS,
PUMPS, ACCUMULATORS,
MIXERS, PULVERIZERS,
HYDRAULIC PRESSES,
CUTTING MACHINES
Immediate Deliveries from Stock

UNITED RUBBER MACHINERY EXCHANGE

319 FRELINGHUYSEN AVE.
NEWARK 5, N. J.
CABLE: "URME"

SINCE 1880 **RUBBER GOODS**

Rand REG. U. S. PAT. OFF.

"They Last Longer" REG. U. S. PAT. OFF.

DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM

RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

PROMOTION IDEAS *that* INCREASE SALES

For dealer helps, trade show give-aways and many other uses, OAK-HYTEX BALLOONS put real showmanship into your advertising and promotion. These balloons are colorful, create interest, build good will.

Use the handy coupon below to secure new illustrated, descriptive folder containing effective advertising plans.

***The* OAK RUBBER COMPANY**
222 S. SYCAMORE ST. • RAVENNA, OHIO

THE OAK RUBBER COMPANY
Ravenna, Ohio
Please send copy of your new Advertising Balloon Folder.
Name.....
Company and position.....
Street.....
City.....

AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS
NATIONAL SHERARDIZING & MACHINE CO.
868 Windsor St. Hartford, Conn.
Representatives: Akron San Francisco New York

JOHNSON HOSE REINFORCEMENT WIRE

High tensile liquor finish hose reinforcement wire for high pressure hydraulic hose of wire braided type. Prompt shipment.

JOHNSON STEEL & WIRE COMPANY, INC.
Worcester 1, Massachusetts

---

101 ENGINEERING VERSATILITY

Engineered Application of Heat in Continuous Materials Handling Systems

INDUSTRIAL OVENS, INC.
13825 TRISKETT ROAD, CLEVELAND 11, OHIO

CLASSIFIED WANT ADS

RATES:
All Classifications (except Positions Wanted):
8c per word in light face type—Minimum, $3.00
12c per word in bold face type—Minimum, $3.00
Positions Wanted:
$1.00 for 40 words or less; extra words, 5c each.
When Box Number is used, add 5 words to word count.

If heading is to be set on separate line, count it as 10 words if light face type is used, or 8 words if bold type is used.
Display or Classified advertisements in borders: $10.00 per column inch; maximum, 85 words per inch.
All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.
Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.

POSITIONS WANTED

RUBBER CHEMIST, forty-three, Ph.D., eighteen years of wide experience in research, development and technical direction in molded, extruded and mechanical goods, drug sundries, foamed and dipped latex (surgeons and household gloves), desires to work with progressive organization. Location immaterial. Address Box 2482, RUBBER AGE.

RUBBER CHEMIST: Graduate Chemical Engineer, nine years experience in compounding, extrusion, calendering, and molding of vinyl, rubber, synthetic rubber. Latex compounding for dipped products included. Seeking compounding and development work in Metropolitan area. Address Box 2491, RUBBER AGE.

ASBESTOS GOODS PRODUCTION MANAGER. Many years experience in all phases of asbestos and asbestos-rubber goods production, including two years as Production Manager. Capable of taking over management or administrative position. Excellent knowledge of foreign markets. Address Box 2502, RUBBER AGE.

LATEX CHEMIST, half credits toward M.S., Stevens Institute, three years varied, two years laboratory and plant supervisory experience, dipped goods. Desires employment Newark-New York City area; age twenty-six, married, salary $3500 per year. Address Box 2506, RUBBER AGE.

A QUESTION TO THE PRESIDENT

Would you like a fresh spirit added to your organization? Adaptable young man desires responsible position as executive assistant. Experienced as Adhesive Plant administrator in all phases of production, sales, promotion, and traffic management. Address Box 2507, RUBBER AGE.

RUBBER AND LATEX CHEMIST with eighteen years of research and factory experience wants position in technical sales, domestic or foreign travel. Speaks several languages fluently. Good appearance and personality. Single. Address Box 2483, RUBBER AGE.

RUBBER CHEMIST AND TECHNOLOGIST. Many years experience, chiefly mechanical goods, hard rubber, gloves, sponge, automotive and airplane parts, etc. Thorough knowledge of compounding and development work. Location immaterial. Address Box 2509, RUBBER AGE.

MEXICO, CENTRAL OR SOUTH AMERICA—American, with many years of experience as rubber chemist, technologist, and factory superintendent in the United States and South America. Thorough knowledge rubber compounding and manufacturing operations. Speak Spanish. Address Box 2510, RUBBER AGE.

TECHNOLOGIST seeks position where over thirty-five years practical experience in rubber compounding, development and processing can be used to advantage. Home or abroad. Address Box 2511, RUBBER AGE.

EXPERIENCED CHEMIST wants position as executive assistant or in research and development work with progressive company. Over twelve years experience with rubber and thermoplastics. Can furnish excellent references. Available immediately. East preferred. Address Box 2516, RUBBER AGE.

CHEMICAL ENGINEER, twenty-seven, four years extensive experience in product development and research of the natural and synthetic latices, water dispersions and solvent solutions of reclaimed and synthetic rubbers, vinyl resins for adhesives, coatings, saturants, binders for all industries; considerable experience in compounding for dipped goods; sales servicing. Desire position as group leader, technical salesman to utilize extensive knowledge. Address Box 2517, RUBBER AGE.

HELP WANTED

CHEMIST FOR LATEX COMPOUNDING. Excellent opportunity with well-established firm located in the East. Send details of education, experience, and salary desired. Address Box 2468, RUBBER AGE.

RUBBER AND LATEX CHEMIST. A progressive New England concern requires an experienced man to supervise production and to control quality line of Shoe Adhesives. Excellent opportunity. State age, education, experience, and salary required. Address Box 2505, RUBBER AGE.

CHEMIST for small rubber shop in the East; also supervise quality control, in wide latitude of responsibilities, if qualified. Address Box 2508, RUBBER AGE.

WANTED—graduate mechanical engineer for sales development in mining and heavy industry by midwestern manufacturer of mechanical rubber products. State qualifications and experience. All communications will be strictly confidential. Address Box 2512, RUBBER AGE.

HELP WANTED (Continued)

RUBBER FACTORY located in Philadelphia, commencing operations in September, requires Plant Foreman, experienced Compounder, Laboratory Technician, Costing Estimator, others. Products: molded and extruded, soft, hard, and sponge rubber. Address Box 2514, RUBBER AGE.

SALESMEN now selling rubber to handle line of rubber grommets. Prompt deliveries. Straight commission. MAYFAIR MOLDED PRODUCTS CORP., 4440 North Elston Ave., Chicago 30, Ill.

WELL ESTABLISHED BELTING PLANT in Pennsylvania has an opening for an experienced man who has knowledge of rubber and synthetic neoprene treatments. Must understand vulcanizing press operation and would be foreman of that department. State particulars regarding experience, availability, and salary required in first letter. Address Box 2518, RUBBER AGE.

CHEMISTS-CHEMICAL ENGINEERS-PLANT MANAGERS
Confidential intermediary for employer and employee operating on a nation-wide basis since 1914.
Your inquiry is not obligating.
SHAY AGENCIES
30 West Washington Street Chicago 2, Illinois

BUSINESS OPPORTUNITIES

We do Rubber Compounding, Light Color Stock Mixings and GR-S Breakdown. FRANK T. BAKER RUBBER PRODUCTS AND COMPOUNDING, 63 Acrh Street, Fall River, Mass.

SELL NOW! PRICES ARE HIGH! Chemicals, Colors, Pigments, Resins, Solvents, Oils, Waxes, Lacquers. Other Materials, Supplies, Equipment, etc. CHEMICAL SERVICE CORPORATION, 84 Beaver St., New York 5, N. Y.

WANTED: Titanium Dioxide. Small or large quantities by manufacturer in allied industry. Advise amount and price. Address Box 2503, RUBBER AGE.

MACHINERY COMPANIES—Experienced representative with intimate knowledge of factory operatons and problems now handling complete line rubber-working used machinery wishes to represent manufacturers of new equipment. Semi-monthly mail contracts with over 1000 rubber factories. A. E. REESE, 2 Broadway (A-18), New York 4, N. Y.

EXPERIENCED REPRESENTATIVE in Argentina wishes to represent company having full line of rubber chemicals. References exchanged. Address Box 2504, RUBBER AGE.

BLACK
Master Batching
Mixing of all kinds.
BESTREAD PRODUCTS CO. STOUGHTON, MASS.

EQUIPMENT WANTED

WANTED: Hydraulic Presses, with Pumps and Accumulators, Banbury Mixers, Mills, Calenders, Tubers, any condition. Address Box 2513, RUBBER AGE.

WANTED: No. 4 or No. 3 Royle or Allen Tuber for rubber extrusion. Also Laboratory Mill, Laboratory Press, and other laboratory equipment including Scott Tensile Tester. Address Box 2515, RUBBER AGE.

WANTED: One laboratory Rubber Aging Oven in good condition. State price. Write GENERAL ASBESTOS & RUBBER DIVISION, North Charleston, S. C. Attention, R. L. Holmes.

EQUIPMENT FOR SALE

FOR SALE: One Farrel-Birmingham 22″ x 60″ 2-roll Rubber Mill, reduction drive and motor; five new Baldwin-Southwark 42″ x 42″ Hydraulic Presses with hydraulic elevating tables; three Baker-Perkins 100 gal. double arm Jacketed Mixers; five Hydraulic Presses 12″ x 12″; three Vacuum Dryers. Send for complete bulletin. BRILL EQUIPMENT COMPANY, 225 West 34th Street, New York 1, N. Y.

FOR SALE: Hydraulic Presses: 36″ x 36″, 16″ ram, 200 tons; 26″ x 52″, 14″ ram, 385 tons; 12″ x 12″, 7½″ ram, 50 tons; 3—15″ x 15″, 8″ ram, 75 tons; 19″ x 24″, 10″ ram, 78 tons; 13″ x 19″, 12″ ram, 100 tons; 20″ x 20″, 14″ ram, 200 tons; 23″ x 17½″, 8″ ram,. 75 tons with pullback; 17″ x 16″, 8″ ram, 75 tons; 22″ x 15″, 8″ ram, 75 tons; 12″ x 13″, 6½″ ram, 50 tons; 8″ x 9½″, 4½″ ram, 20 tons; 50″ x 32″, 24″ ram, 700 tons; 21″ x 24″, 20″ ram, 500 tons. Pumps: HPM Triplex 1½″ GPM, 2500#; Robertson Duplex 1¾ GPM, 4000#; Gould Triplex 12 GPM, 1250#; Worthington 2½ GPM, 4000#; Worthington Triplex 12 GPM, 2500#; 4 Plunger 6 GPM, 2000#; Watson Stillman Duplex 1 GPM, 2500#. Preform Machines: Stokes DDS-2; Kux 1-CS-Colton 5½. Extruders: #3 Royle Perfected; Allen 6″. Mixers: W&P 100 gal, unjacketed; W&P 100 gal. jacketed. Mills, Calenders, Laboratory Presses, Accumulators, Hydro-pneumatic and weighted types, etc. Highest prices paid for your used equipment. UNIVERSAL HYDRAULIC MACHINERY COMPANY, 285 Hudson Street, New York 13, N. Y.

FOR SALE: Twenty Hydraulic Presses 12 x 12 x 42 x 42 single and multiple opening, rams up to 24″. One 10 x 20 Mill, reduction drive and motor. One 48″ x 48″ four opening Hydraulic Press. One 9 x 40′ High Pressure Vulcanizer with quick opening door. One French Hydro-pneumatic Accumulator. 100 gallon and 200 gallon Baker Perkins Heavy Duty Jacketed Mixers. Two Royle #½ Tubers. One Southwark 7″ x 7′ Hydraulic Accumulator. Miscellaneous Hydraulic Presses, Pumps, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS COMPANY, INC., 14-19 Park Row, New York 7, N. Y.

FOR SALE: One Watson-Stillman Hydro-Pneumatic Accumulator, 200# Sq. In. Air Pressure, 4200# Sq. In. Hydraulic Pressure, size of Accumulator 11′6½″ x 3′8″, complete with Pumps, Air Compressors, Tanks, and Piping; Condition, new. Three Ross Pony Mixers, 45-gals. Four Day Pony Mixers, 5-gals., 20-gals., 40-gals. Twenty American Tool Rubber Churns, 200-gals. Six Goulds Bronze Centrifugal Two-Stage Pumps, Fig. 3380, Size 32S, 30 HP, 2200 RPM, 225 ft. Head, 30 HP Louis-Allis DC Motors. Address R. GELB & SONS, INC., Union, N. J. Phone: UNionville 2-4900.

HYDRAULIC PUMPS

Aldrich Pump Co. Vertical Triplex HYDRAULIC PUMPS, 2¾″ x 8″ equipped with herringbone gears, 67.5 GPM. Maximum pressure for intermittent duty 2,200 lbs., for continuous duty 1,800 lbs. Pump and motor mounted on common bed plate.

Motors are 75 HP, 3/60/220-440 volts, 1740 RPM. Complete with starting panel, consisting of G.E. motorstarter switch, push button control, square "D" switch and capacitator.

Purchased new 3½ years ago. Excellent condition. Available for immediate delivery.

CONSOLIDATED PRODUCTS CO., INC.
14-19 Park Row **New York 7, N. Y.**

SPECIALIZING IN
USED MACHINERY FOR THE **RUBBER**
AND ALLIED INDUSTRIES
MILLS, CALENDERS, HYDRAULIC PRESSES,
TUBERS, VULCANIZERS, MIXERS, ETC.
ERIC BONWITT 431 S. DEARBORN STREET CHICAGO 5, ILLINOIS

WANTED . . .
RUBBER PLANT
CASH PAID
FOR CAPITAL STOCK OR ASSETS
Large financially powerful diversified organization wishes to add another enterprise to present holdings.
Existing Personnel Normally Retained
ADDRESS: Box 1212 - 1474 Broadway, New York 18, N. Y.

NEW & REBUILT MACHINERY
Equipped to Furnish Complete Plants
L. ALBERT & SON
OFFICES AND PLANTS
TRENTON, N. J. • CHICAGO, ILL. • AKRON, OHIO
LOS ANGELES, CALIF. • STOUGHTON, MASS.

Our Rebuilding Process Removes the Element of Risk by These Five Important Steps:
1. INSPECTED
2. DISASSEMBLED
3. REBUILT
4. MODERNIZED
5. GUARANTEED

Our New Machines:
MILLS
MIXERS
BRAKES
PRESSES
CUTTERS
SUSAN GRINDERS

RUBBER & PLASTIC
Machinery Repaired and Rebuilt
A Complete Machine Shop and Welding Service for:
MILLS — CALENDERS — EXTRUDERS — MIXERS
PRESSES—SHEETERS—EMBOSSERS—STEAM PLATES
SPEED REDUCERS—VULCANIZERS—LABORATORY EQUIPMENT
RELIABLE WELDING & MACHINE SHOP
2014 Union Turnpike North Bergen, N. J.

HOWE MACHINERY CO., INC.
30 Gregory Avenue Passaic, N. J.
DESIGNERS & BUILDERS
OF V BELT MANUFACTURING EQUIPMENT
Cord Latexing, expanding mandrels, automatic cutting
skiving, flipping and roll drive wrapping machines
ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT
Call or Write

Directory of CONSULTANTS

PHILIP TUCKER GIDLEY
Consulting Technologist—Research, product development, formulas, factory plant engineering, chemical and physical testing.
Fairhaven, Massachusetts

L. F. LEATHERMAN
Consulting Technologist—Formula Development—Factory Processing Problems. Tires, Tubes, Heels, Soles, All types of Molded and Extruded Goods.
2016 Lakewood Ave. Lima, Ohio

THE JAMES F. MUMPER CO.
Plant Engineering—New plants, alterations, rehabilitation, modernization. Maintenance and special equipment. Tool design. Plans, specifications, investigations and reports. Complete engineering for industry.
313-14-15 Everett Bldg., Akron 8, Ohio

R. R. OLIN LABORATORIES
Rubber Technologist—Development and research in Natural Rubber, Synthetic Rubber and Plastics. Also chemicals and compounding materials used with these materials.
P. O. Box 372 (Telephone HEmlock 3724) Akron 9, Ohio

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service. Ask for Booklet No. 16, "The Chemical Consultant and Your Business."
29 W. 15th Street, New York 11, N. Y.

INDEX TO ADVERTISERS

A

Adamson United Co. 391
Adhesive Products Corp. 501
Advance Solvents & Chemical Corp. 501
Agawam Chemicals, Inc. ..... —
Akron Standard Mold Co. 481
Albert & Son, L. 505
American Anode Inc. 415
American Cynamid Co.
Calco Chemical Division 395
Industrial Chemicals Division 422
American Zinc Sales Co. 406
Astlett, H. A. & Co. ..... —
Atlas Electric Devices Co. ..... —

B

B. B. Chemical Co. 396
Baird Rubber and Trading Co. ..... —
Baker Chemical Co., J. T. 493
Barrett Div. Allied Chemical & Dye Corp. .. 416
Bassett, W. E. Co. ..... —
Beacon Co. 427
Bestread Products Co. 504
Binney & Smith Co. .....Insert Following 464
Black Rock Mfg. Co. ..... —
Bonwitt, Eric 505
Brockton Cutting Die & Machine Co. ..... —
Brown Co. ..... —

C

Cabot, Godfrey L., Inc. 399
Caldwell Co., The 490
Cambridge Instrument Co. 485
Cameron Machine Co. ..... —
Carbide & Carbon Chemicals Corp. 423
Carey, Philip, Mfg. Co. 499
Carter Bell Mfg. Co., The 499
CLASSIFIED ADVERTISING 504, 505
Cleveland Liner & Mfg. Co. 392
Columbian Carbon Co. .....Insert Folowing 464
Connor, Charles F., & Co., Inc. ..... —
CONSULTANTS SECTION 505
Continental Carbon Co. ..... —
Continental Machinery Co. 481
Continental-Mexican Rubber Co. ..... —

D

Dewey & Almy Chemical Co. 491
Dow Corning Corp. 480
Du Pont de Nemours & Co., E. I.
Inside Front Cover

E

Emerson Apparatus Co. ..... —
English Mica Co. 499
Enjay Co., Inc. 477
Erie Engine & Mfg. Co. 485

F

Farrel-Birmingham Co., Inc. 394
Firestone Tire & Rubber Co. 417
Flintkote Co., The ..... —
Fricke Co., J. E. 481

G

Gammeter, W. F., Co. 503
General Atlas Carbon Co. 405
General Chemical Co. ..... —
General Latex & Chemical Corp. 400
General Magnesite & Magnesia Co. 491
Genseke Brothers 424
Gidley, Philip Tucker 505
Goodrich, B. F., Chemical Co. (Chemicals) 390
Goodrich, B. F., Chemical Co. (Geon) 389
Goodrich, B. F., Chemical Co. (Hycar) 387
Goodyear Tire & Rubber Co. 393
Grant Engineering Co. 487

H

Hall Co., The C. P. 479
Harwick Standard Chemical Co. 419
Henriques, A., & Co., Ltd. 503
Hercules Powder Co., Inc. ..... —
Herron Bros. & Meyer ..... —
Heveatex Corporation 495
Hoggson & Pettis Mfg. Co. ..... —
Holliston Mills, Inc. ..... —
Howe Machinery Co., Inc. 505
Huber, J. M., Corp. 434

I

Independent Die & Supply Co. 503
Industrial Ovens, Inc. 503
Interstate Welding Service 408

J

Jacoby, Ernest & Co. 499
Johnson Steel & Wire Co., Inc. 503

K

Keasbey & Mattison Co. ..... —

L

Lambert Co., E. P. 497
Leatherman, L. F. 505
Littlejohn Co., Inc. ..... —

M

Magnetic Gauge Co. ..... —
Marbon Corp. ..... —
Maryland Cork Co. 501
McNeil Machine & Engineering Co. ..... —
Mercer-Robinson Mfg. Co. 484
Meyer & Brown, Inc. 493
Monsanto Chemical Co. ..... —
Moore & Munger 428
Mt. Vernon-Woodbury Mills, Inc. 401
Muehlstein & Co., H., Inc. 402
Mumper, James F., Co. 505

N

National Lead Co. 430
National Rosin Oil & Size Co. 499
National Rubber Machinery Co. 410
National Sherardizing & Machine Co. 503
National-Standard Co. 426
Naugatuck Chemical, U. S. Rubber Co. 436
Neville Co. ..... —
New Jersey Zinc Co. 433
Niagara Alkali Co. .....Insert Following 431
Norris Mfg. Co. ..... —

O

Oak Rubber Co. 503
Olin Laboratories, The R. R. 505

P

Pennsylvania Industrial Chemical Corp. .... —
Pequanoc Rubber Co. 420
Phillips Petroleum Co. 388
Pittsburgh Plate Glass Co., Columbia Chemical Div. ..... —
Polymel Corporation ..... —
Precision Scientific Co. 486
Preco Incorporated 484
Preventive Maintenance Co. 411
Procter & Gamble 492

R

Rand Rubber Co. 503
Randall, Frank E., Co. 487
Rare Metal Products Co. 501
Reliable Welding & Machine Shop 505
Resinous Products & Chemical Co. 409
Revertex Corp. of America 495
Robinson Mfg. Co. 484
Rodic Rubber Corp. ..... —
Rohm & Haas Co. ..... —
Royle & Sons, John 483

S

St. Joseph Lead Co. 418
Schrader's Son, A. 398
Schulman, A., Inc. .....Inside Back Cover
Scott Testers, Inc. ..... —
Sharples Chemical Inc. .....Insert Following 402
Shell Oil Co., Inc. 407
Simplex Cloth Cutting Machine Co., Inc. .. 483
Skelly Oil Co., Solvents Div. ..... —
Snell, Foster D., Inc. 505
South Asia Corp. 497
Spadone Machine Co. ..... —
Stabelan Chemical Co. 490
Stamford Rubber Supply Co. 506
Standard Oil Co. (Indiana) 429
Stauffer Chemical Co. 493
Stein, Hall & Co., Inc. ..... —
Stern Can Co. ..... —
Sun Oil Co. 475
Symons, Ralph B. ..... —

T

Tanney-Costello Co. 497
Taylor Instrument Companies ..... —
Texo Corporation 501
Textile Proofers, Inc. 482
Thropp & Sons, William R. 486
Titanium Pigment Corp. ..... —
Trade News Service 503
Turner Halsey Co. 401

U

Union Bay State Chemical Co. 488
Union Carbide & Carbon Corp. 423
Union Pacific Railroad 412
United Carbon Co. .....Insert Following 412
United Engineering & Foundry Co. ..... —
United Rubber Machinery Exchange 503
U. S. Rubber Reclaiming Co. 397
Utility Mfg. Co. 483

V

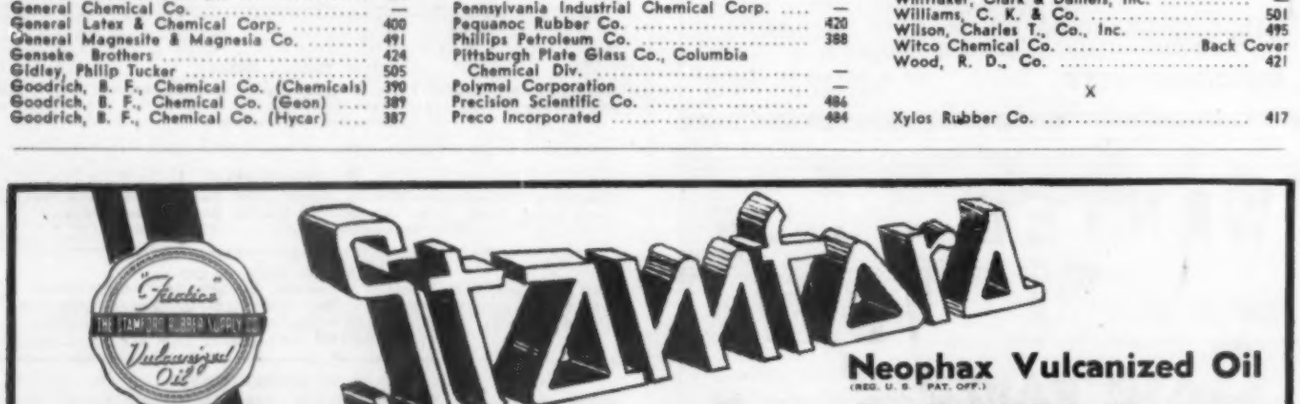
Vanderbilt, R. T. Co. .....Front Cover

W

War Assets Administration 425
Warwick Chemical Co. ..... —
Weber, Herman & Co., Inc. 497
Westinghouse Electric Corp. ..... —
White, J. J., Products Co. 487
Whittaker, Clark & Daniels, Inc. ..... —
Williams, C. K. & Co. 501
Wilson, Charles T., Co., Inc. 495
Witco Chemical Co. .....Back Cover
Wood, R. D., Co. 421

X

Xylos Rubber Co. 417

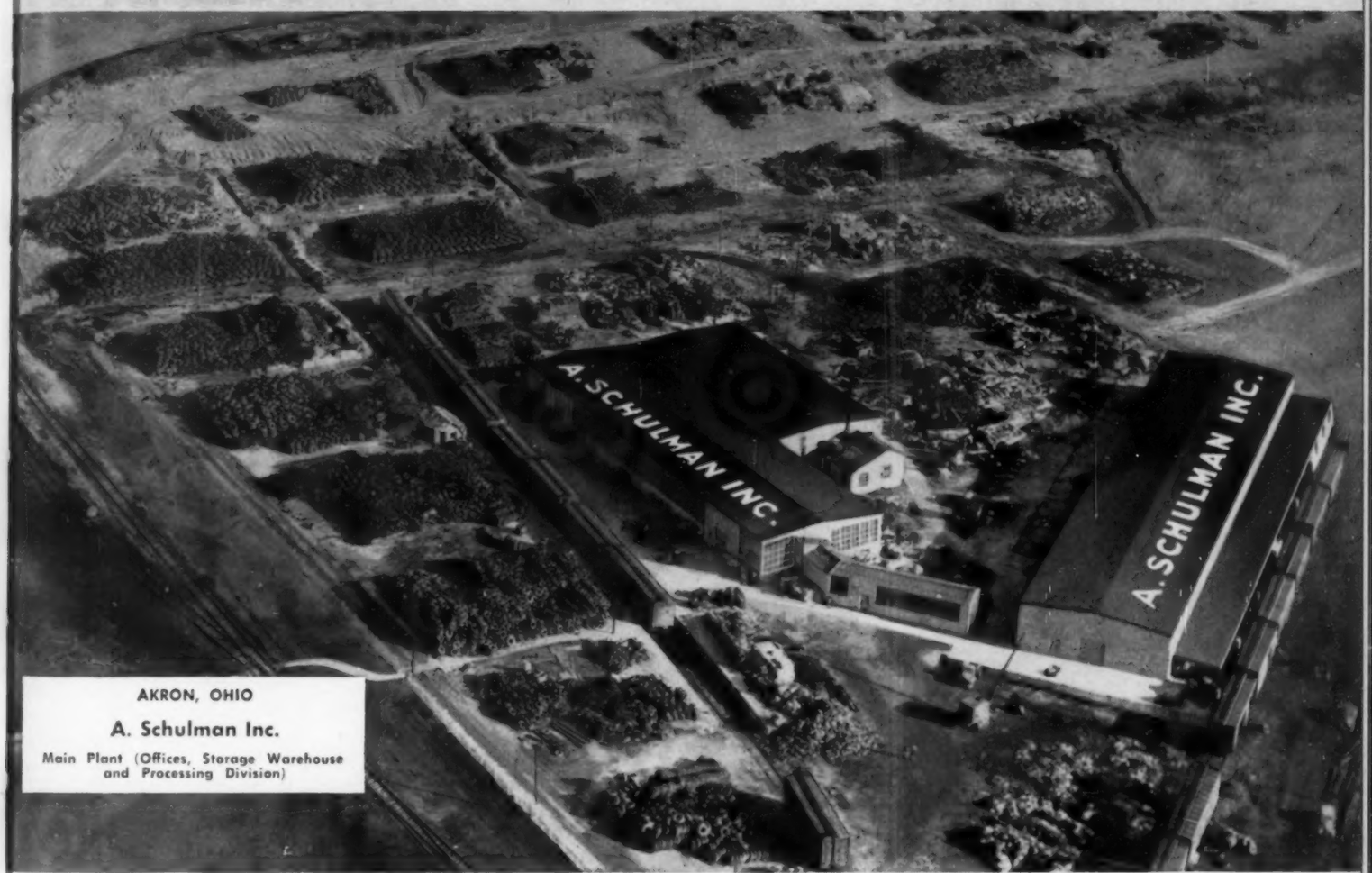


HUGHES PRINTING CO., EAST STROUDSBURG, PA.

JERSEY CITY, NEW JERSEY
A. Schulman Inc. Warehouses (Offices in New York)

LONG BEACH, CALIFORNIA
A. Schulman Inc. Office, Plant and Warehouse

EAST ST. LOUIS, ILLINOIS
A. Schulman Inc. Office, Plant and Warehouse



AKRON, OHIO
A. Schulman Inc.
Main Plant (Offices, Storage Warehouse and Processing Division)

OFFICES and PLANTS THROUGHOUT THE UNITED STATES TO SERVE THE WORLD

Wherever you are located, whatever you may need in Scrap Rubber, Crude Rubber, Hard Rubber Dust or Plastic Scrap — the coast to coast organization of A. Schulman Inc. is equipped and ready to give you efficient service. Just call your nearest Schulman office.

OFFICES: Akron, Ohio • New York City • Boston, Mass.
E. St. Louis, Illinois • Long Beach, California

WAREHOUSES: Akron, Ohio • E. St. Louis, Illinois
Long Beach, California • Jersey City, New Jersey

A. Schulman Inc.
Rubber and Plastics
790 E. TALLMADGE AVE., AKRON, OHIO

more and more

WITCO STEARATES

to meet increasing demands

The unusual properties of the metallic salts of stearic acid result in the almost daily discovery of new uses.

To supply this increasing demand Witco has constructed in Chicago, and is now putting into operation, an additional plant which ultimately will double the capacity of its Brooklyn plant.

Shipments can now be made either from New York or Chicago.

Quality STEARATES for over a quarter of a century

ALUMINUM • BARIUM • CALCIUM • LEAD • LITHIUM • MAGNESIUM • SODIUM • ZINC

Samples on Request

WITCO CHEMICAL COMPANY
MANUFACTURERS AND EXPORTERS
295 MADISON AVENUE · NEW YORK 17, NEW YORK
LOS ANGELES • BOSTON • CHICAGO • DETROIT • CLEVELAND • AKRON
SAN FRANCISCO • LONDON AND MANCHESTER, ENGLAND